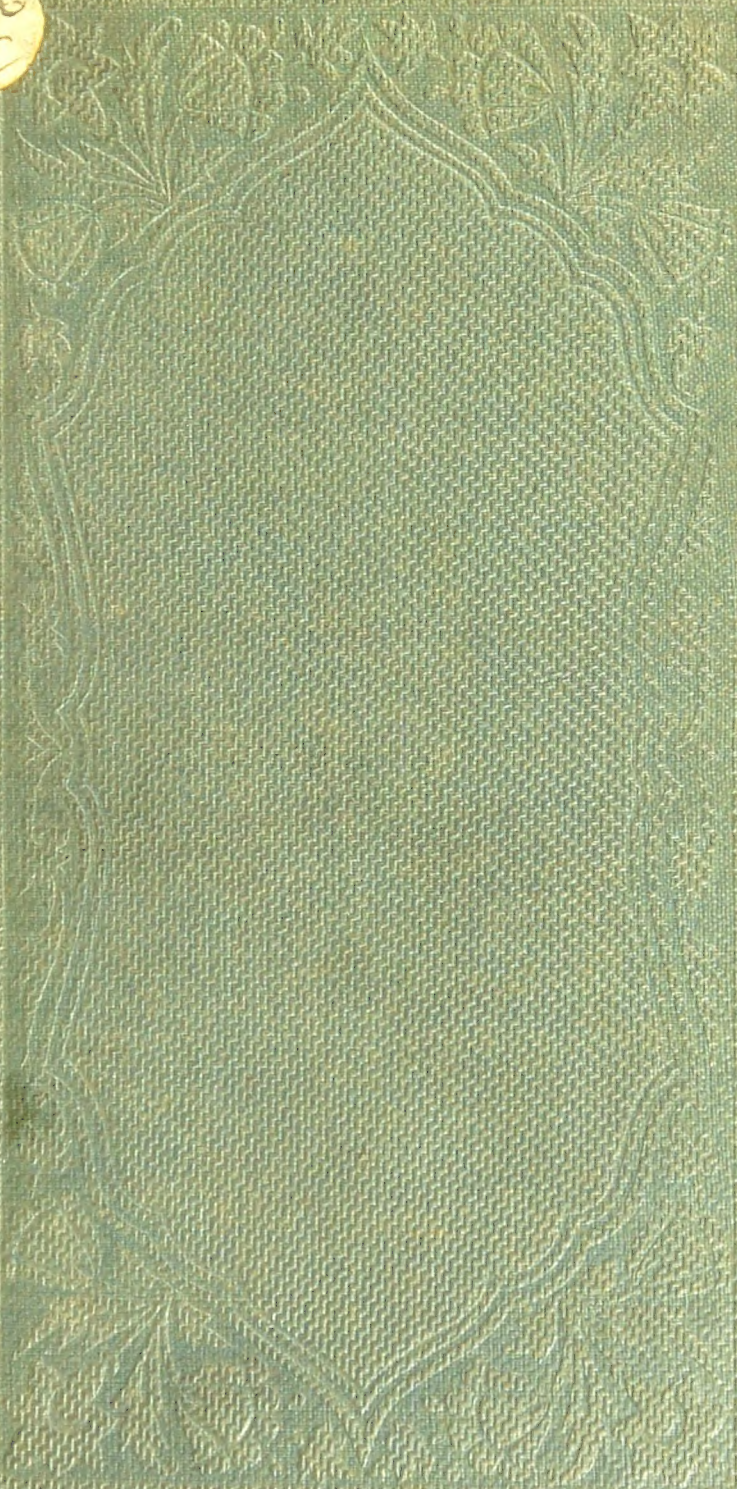
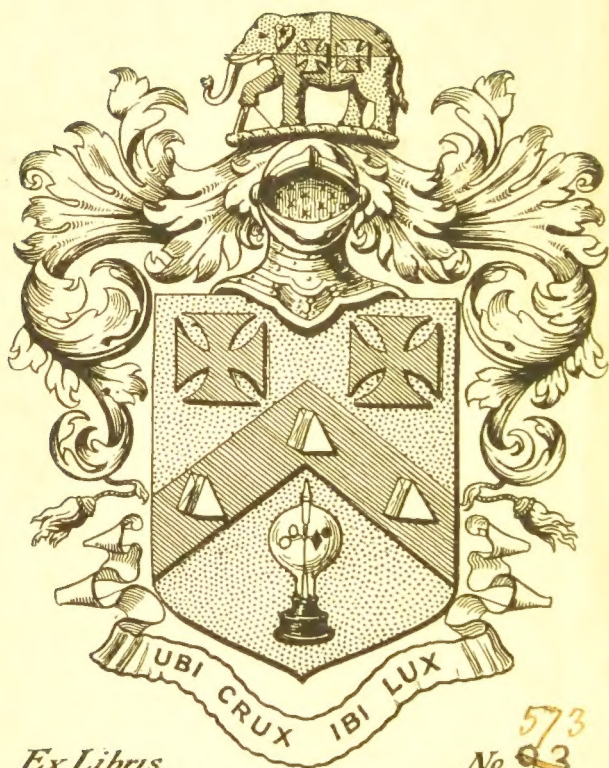


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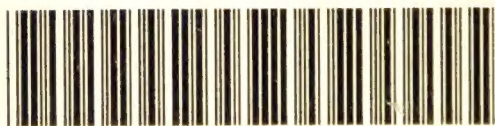




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THE  
LICHEN-FLORA

OF  
GREAT BRITAIN, IRELAND AND  
THE CHANNEL ISLANDS.

BY THE  
REV. W. A. LEIGHTON, B.A.

F.L.S. F.B.S. Edin.

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SECOND EDITION,

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Shrewsbury :

PRINTED FOR THE AUTHOR.

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1872.

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“Think of the beauty which God has spread abroad for our use its profuseness in desert spots where none can see it ; its minuteness, so that much can only be discovered by a microscope ; and its extent, embracing all things.”—*Sewell*.

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# INTRODUCTION

## TO THE

### STUDY OF LICHENS.

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The Lichenes are a Natural Order of cellular plants intermediate between the Algæ and Fungi—uniting themselves to the genera *Scytonema*, *Sirosiphon* and *Nostoc* of the former through the *Collema*—and to the *Ascomycetes* of the latter, by having the spores in asci or thecae and their hymenium often included in an enclosed receptacle or perithecium like the *Sphæria*. Their own peculiar characteristic is that they have gonidia or minute spherical bodies containing chlorophyll or some green granular matter, immediately underneath the cortical layer of the thallus, and that their hymenium is tinged blue or of a red-wine colour by an aqueous solution of iodine. They may be found everywhere, clothing rocks, trees, old palings, stones and earth, and giving to these localities those beautiful patches of colour which the artist delights to touch in, and which give such brilliance and finish to his landscape sketches. They attain their maximum developement in the *Stictæ* and *Parmeliæ* of the tropics, but are also found distributed throughout the temperate and frigid zones even to the arctic circles. Their variation in altitude is also very great, ranging from the sea-level to 14 or 15,000 feet. Their growth is very slow and intermittent, depending on the dryness or humidity of the atmosphere, from which, so far as is at present known, they derive their nutriment and powers of vegetation. Their duration of life is remarkable and excessive, probably extending to many centuries. They will not grow in a flourishing or perfect condition in the immediate neighbourhood of towns, or where the air is impregnated with smoke, soot, or other deleterious ingredients. In such situations they exist only in a gonidial or rudimentary state, appearing on the trees, walls, &c., as green dust, in which state they will continue for ages, increasing by bisection like the Algæ, but never developing into perfect lichens. The pseudo-genus *Lepraria* of the elder botanists represented this condition. Their abundance in a fully developed and fructiferous condition is a sure and certain indication of the purity of the air and salubrity of the climate.



A lichen consists of a thallus or vegetative portion, bearing the fructification in the apothecium or female fruit, and the spermogonium or supposed male fruit. There are also other bodies, occasionally found on the thallus, termed *pycnides*, which some consider as a kind of secondary fruit, and others as fungilli.

The thallus is very variable in form, size, colour and consistence, and is either horizontal and membranaceous or foliaceous, or pendulous and filamentose, or occurring in small erect shrublike clusters, or else forming a more or less thick crumbly or powdery crust investing the surface of rocks and trees, and becoming lobed in various modes in the circumference. This thallus consists generally of a *cortical layer* on the upper surface formed of minute closely compacted cellules, immediately underneath which is the *gonidial layer* consisting of bright green spherical cells arranged in an interrupted manner, immediately above the *medullary layer* which consists of interlacing tubular and articulate colourless filaments. The lower surface is either naked or has a cortical layer similar to the upper one and also *rhizinae* or rootlike filaments which attach it to the surface upon which it grows. Underneath the entire lichen is the *hypothallus*, generally of a black or dark colour, formed of filaments or compacted cells, and which in fact is the primordial vegetation arising from the germination of the spores, and upon which the several other layers of the thallus are gradually and eventually deposited. This hypothallus is often only perceptible in a dark border around the thallus. The thallus is conspicuous enough in the forms above mentioned, but is often *hypophlæodal* or concealed beneath the epidermis of the bark on which it grows, or *evanescent*, existing only in scattered portions on or under the friable face of the rocks, or in other cases altogether wanting when the apothecia grow parasitically on the thallus of other lichens, possessing no proper thallus of their own. In the crustaceous lichens the medullary layer has few filaments but abundant molecular granulations, often of oxalate of lime.

The *gonidia* are of two sorts—either a simple cell containing granular matter termed a *gonidium*, or clusters of two, three or more spherical granules without any proper cellular membrane, containing green granular matter and named *granula gonima*. These gonidia, together with the molecular granulations, and filaments of the medullary layer, are often protruded through the cortical layer to the surface of the thallus in powdery or granular eruptions of a globular shape termed *soredia*.

The *apothecium* of whatever form, whether patellulate, lirellate, or enclosed in wartlike perithecia or nuclei, has a similar internal structure and when viewed in a vertical section is seen to consist of a receptacle formed of cells generally compact, termed the *hypothecium*, either dark or colourless, from whose upper surface in an erect position grow the *asci* or *thecae* and the *paraphyses* constituting the *hymenium* or *thalamium*, and are conglutinated by a jellylike mucus termed the *gelatina hymenæa*. The *paraphyses* are slender filaments having minute globular or clavate apices

filled with coloured granular matter, which by their close proximity, constitute the disk or *epithecium*, and to which they give their peculiar colour. Around this disk or epithecium is a margin formed by the edges of the hypothecium and of the same colour, or else formed by the thallus and partaking of its peculiar colour. The former is termed a *proper margin*, the latter a *thalline margin*. The *asci* or *thecæ* are linear, clavate, or globular sacs or vesicles containing the *spores* which in different species are variable in form, size, and colour, either brown or colourless, simple or divided by septa or otherwise into several cells, and in number generally 8 but sometimes 1, 2, 4, 6, or innumerable. The spores contain either granules or oily nuclei, and have an outer and inner paries or wall termed respectively *epispore* and *endospore*.

The *spermogonia* are minute globular conceptacles imbedded in the thallus, distinguishable on its surface as minute tubercles, and in section exhibiting a colourless receptacle from which arise minute filaments either simple, (*sterigmata*) or articulate, (*arthrosterigmata*) bearing on their summits or joints very minute rodlike or cylindrical straight or curved bodies (*spermatia*), which the slightest pressure detaches and protrudes in a cloudy stream through a pore in the apex of the spermogonium.

The *pycnides* are minute dark-coloured conceptacles, like the perithecia of *Sphæriæ*, sessile on the thallus and containing simple filaments (*basidia*) bearing singly on their apices, bodies, often oblong, but variable in form and size (*stylospores*).

On the under surface of the thallus of the *Stictes* are minute urceolate pale excavations termed *cyphellæ*, whose function is unknown. These are generally empty but when filled with white or citrine powder are called *pseudocyphellæ*.

The thallus of several genera bears on its upper surface orbicular and flattened, or globular tubercles named *cephalodia*, consisting internally of cells or granula gonima. Their use is unknown. This upper surface is also frequently found exuberant with minute, erect, coral-like excrescences with dark-coloured apices and then constitutes the old pseudo-genus *Isidium*, which is now known to be really an anomalous state of the thallus of some *Pertusaria*. Black powdery patches or spots are scattered on the thallus not unfrequently, which formerly constituted the old pseudo-genus *Spiloma*, but are now considered to consist of minute parasitical fungilli.

In the genus *Pertusaria* the apothecia become abortive and sterile and converted into soredia, on which state was anciently founded a pseudo-genus *Variolaria*.

In collecting Lichens it is requisite to be furnished with a geological hammer and iron chisels of good temper, to detach thin pieces from rocks, with the lichens growing thereon, and also with a strong sharp clasp knife, or strong oyster knife to cut or prise off Lichens from the bark of trees or from old palings, &c., and a pocket lens. All that is necessary to preserve such specimens is immediately to fold them in soft paper, to prevent injury from



rubbing against each other in carriage home. They require no drying or pressure, and are always in a condition proper for examination. Generally speaking, it will be advisable to collect specimens in dry weather. Rain is apt to swell up the parts of lichens so much, as to render them rather difficult to be distinguished from each other in their native localities, and specimens gathered in wet weather will not unfrequently be found destitute of spores, which by the lateral pressure on the asci occasioned by the swelling of the adjacent parts by the moisture, have been ejected. The practice I myself adopt, and which will be found useful, is on return home, to fix the specimens on paper, with strong glue, writing the locality from whence obtained, and then arranging them roughly in genera. This arrangement, leading to the successive examination of several species, or specimens, in any particular genus, will be found to facilitate, by comparison and contrast, their satisfactory determination. I myself do not poison specimens with corrosive sublimate, having found that continual reference and turning over the specimens to be sufficient to prevent destruction by insects. It is possible also that the lichens so poisoned may show different or unsatisfactory results with chemical reagents,—but this by the way.

Every lichenist is unfortunately well aware of the great difficulty of preserving specimens of lichens which grow on the earth. Too frequently he finds, on consulting his herbarium, that the earth on which such lichens grew has become dry and crumbled into dust, involving in such disintegration the destruction of the lichen itself especially when this happens to possess a crustaceous thallus. To remedy this a solution of gum arabic has been sometimes used, but with partially satisfactory results only, inasmuch as the mucilage does not penetrate the earth, but only conglomerates its surface. An effective preparation appears to have been discovered by M. J. M. Norman, of Trömsø, Norway. It consists of a solution of isinglass in spirits of wine, such as is used in the preparation of English adhesive plaster, which a chemist informs me is better known as "Prout's plaster." This composition, when liquefied in a vessel plunged into water of the temperature of 25—30° C., is greedily imbibed by the earth on which the lichen grows, and becomes inspissated into a solid gelatine at a temperature below 15°. The solution may be applied by a camel's-hair pencil until the earth becomes saturated, but care should be taken that the lichen itself be not moistened with it, for otherwise it would become discolored. When the surface has become dry, the specimen may be submitted to moderate pressure, which, after some days, produces the requisite hardness and tenacity. The favourable experience of some years encourages M. Norman to recommend this preparation to his fellow lichenists.

The mode of arrangement or preservation in the herbarium must be left to individual taste and convenience. I will merely indicate that which I have adopted as practically most convenient. Having individual specimens glued down on small or suitably-sized pieces of paper with their names, localities, collector's name,



date of collection, and drawings or notes of spores and internal structure appended, I fasten these with small pins on quarto single sheets of good cartridge paper, from which any particular specimen can be readily removed for examination and replaced as occasion requires. These single sheets are then placed in a cover of cartridge paper also of quarto size, and the name of the species written on the left hand corner at the bottom on the outside. These covers, each containing a single species, are enclosed in a quarto cover of thick pasteboard, folded bookwise, marked on the back with the name of the genus, and are kept bookwise on shelves in cabinets, arranged according to the system, and in the larger genera to the sections, adopted in the following work. Reference to any particular specimen is thus readily practicable, even in the most extensive genus, and constant use and practice insensibly and gradually impress on the mind, a lasting knowledge of systematic arrangement.

The successful study of lichens is not really so difficult as persons imagine, if only they will bring to the work, careful painstaking observation, delicate manipulation in dissection, and a microscope with a good object glass of  $\frac{1}{4}$  inch focus. The mode of examination which may be adopted is this. Moisten the apothecium with water, then applying a watchmaker's lens to the eye, make with a sharp surgeon's knife or scalpel, a very thin vertical section through the centre of the apothecium. Place this on the lower glass of a compressor, in a drop of hydrate of potash which assists in loosening the cohesion of the parts, and swells the spores to their proper shape, bring down the upper glass of the compressor with slight pressure, and place the whole under the microscope, increasing the pressure by the screw of the compressor gradually as vision shows to be necessary. A view is thus obtained of the asci, spores, paraphyses, structure and colour of the hypothecium &c. and drawings may be made of any of them most readily either with a camera lucida or by throwing the microscope into a horizontal position and placing an oblique steel disk on the end of the eye piece, on looking through which a picture of the object is thrown on paper and may be traced with a pencil, the extraneous light being excluded by covering the head with a dark coloured cloth.

If the spores be mature the application of an aqueous solution of iodine will tinge them or the gelatina hymenea blue, or of a red-wine colour, with or without a preceding blue tinge. This re-action occurs only in some lichens, whilst in others there is no such re-action produced, hence it proves useful as a slight confirmatory character. The formula by which the solution is to be prepared is:—Iodine gr. j. ; Iodide of Potash, gr. iij ; Distilled water,  $\frac{1}{2}$  oz. which must be kept in a glass stoppered bottle of dark coloured glass, or covered with tin foil to exclude light. In using this test, the section of the apothecium must be placed in the iodine solution at once, and not previously in the hydrate of potash, which would nullify the re-action. To test the thallus either on its cortical layer, or in the medulla, hydrate of potash is used, compounded of equal

weights of caustic potash and water. Hypochlorite of lime (chloride of lime and water) is another reagent, which may be made of any strength. These are applied by small brushes made of spun glass, one brush being kept exclusively for each reagent, and also a separate vessel used for each. The *modus operandi* is this, touch the cortical layer or the medulla (exposed by scraping off a morsel of the cortical layer) with the hydrate of potash, and while still moist apply the hypochlorite of lime, and note whether any re-action, and of what kind results. Sometimes the hydrate of potash produces a distinct yellow tinge, which may be symbolised as (K +) or if only faint as (K f +). This yellow reaction is sometimes persistent, (K +) but in other lichens immediately changes to a red colour (K yellow then red). In others the yellow produced by the hydrate of potash, is changed into red, or the yellow is deepened, by the immediate application of hypochlorite of lime, symbolised (K yellow C red) or (K yellow, C deep yellow). Again the hydrate of potash may produce no re-action, but the immediate subsequent application of hypochlorite of lime elicits red or yellow as the case may be, symbolised thus (K - C + red) or (K - C + yellow). Sometimes neither reagent produces any reaction and is thus noted (K - C -). A very convenient mode of symbolising the reaction of the cortical layer and medulla of the same lichen is to place the reaction of the former above that of the latter thus (K + C =). These reactions which may be generally obtained on any portion of the thallus, are frequently more vivid on the younger or circumferential portions. Success depends on the reagents being freshly compounded and of the proper strength, and temperature has also something to do with it, as in very severe cold weather the reaction takes place very slowly and imperfectly, and perhaps at all times it would be advisable to warm the reagent. Great cleanliness must be observed with the brushes and vessels which should be thoroughly wiped dry after using. None of the liquid reagent should be left exposed to the air from one day to another, nor a fresh supply added to any which has been so exposed, nor must any which has been once used be returned to the stock bottles, which should always have close fitting glass stoppers. Neglect of these precautions results in failure and uncertainty.

The following work is arranged as to Families, Tribes and Genera, with some slight modifications, on the system of Dr. W. Nylander of Paris, as being simple and philosophical, founded on a general consideration and balancing of all the parts of lichens, their external and internal structure, and as exhibiting their combination with the Algæ and Fungi to which Lichens are intermediate. To facilitate the student's labour in the ready and accurate determination of his specimens, the species, especially in the more extensive genera, such as *Lecanora*, *Lecidea*, *Verrucaria*, &c., have been thrown into small groupes, comprising 2 to 10 or 12 species each, distinguished either by the peculiar external character of the thallus or the forms and colour and septa of the spores, and in the largest genus *Lecidea*, each of such groupes is again subdivided into lesser

ones according as the hypothecium is dark or colourless. Objectionable as such an arrangement confessedly is in separating allied species, it is believed it will be nevertheless found convenient and useful. In the diagnoses the prominent and distinguishing characters are printed in italics, and the chemical reaction added as a confirmatory aid. Its general habitat, relative frequency or scarcity, date of first discovery in Britain, (also appended afterwards to the name of its discoverer,) are given. The Synonymy has been purposely made concise, retaining only a reference to the work in which each lichen was first described and named, and also to the works of Acharius, the Linnæus of Lichenology and greatest of præmicroscopic lichenists; and finally to the various works of Dr. W. Nylander the *facile princeps* of modern microscopic lichenologists; and to those of humbler students, where necessary. By a reference to these works the synonymy may be, if desired, followed out *in extenso*. References are made to characteristic figures of the lichen, its spores, &c. No micrometric measurements of the spores are given, because the decimal fractions of a line, when expressed in figures, really convey no definite idea of size to the mind, and moreover no two writers appear to agree in such measurements. In reality the spores of lichens are very variable in the same apothecium and not unfrequently even in the same ascus, but the eye by constant practice soon becomes able to detect a normal form and magnitude. Taking then the spores of *Pertusaria* as *very large*; those of *Lecidea contigua*, and *Lecidea coarctata* as *large*; those of *Lecidea parasema* as *moderate*; and those of the polysporous species of *Lecanora* and *Lecidea* as *minute*; approximate ideas will be readily gained.

References are made to various published Exsiccati, Continental and British, enumerated hereafter; and in the preparation of the work the Herbaria of Mr. Dawson Turner, Mr. Borrer, and the Hookerian Herbarium at Kew; many original specimens from Acharius; the collections of Dr. Greville, Dr. George Johnston, Mr. Carroll, Mr. Crombie, Mr. Larbalestier, and many others have been consulted and examined, and where necessary microscopically. To which must be also added my own immense Lichen-Herbarium (without exaggeration the finest and most extensive private one, both as to British and Tropical lichens, in the kingdom and destined at my death to be presented to the National Herbarium at Kew) comprised in 400 quarto cases occupying bookwise, shelves 120 feet in length.

The general geographical distribution throughout the world of each lichen; and its distribution throughout Great Britain &c. indicated by figures corresponding with the Botanical Provinces of Mr. H. C. Watson's *Cybele Britannica* and Moore and More's *Cybele Hibernica* are inserted. The names of Botanists on whose authority those localities rest are appended, and a note of admiration (!) added where a specimen from any locality has been personally examined. Those localities to which no name is appended have been ascertained by the personal research of the author, and for these he alone is responsible.



From the above it will be seen what extensive portions of our country are still unexplored *as to lichens*; e.g. the whole of the north and north-western counties of Scotland, including the Hebrides, Orkney and Shetland Isles (notwithstanding the few scattered notices of commoner species in the Edinburgh Botanical Transactions all inserted); nearly the whole of the north, north-west and midland counties of Ireland; in England, the counties of Cheshire, Lancashire, Derby, Nottingham, Lincoln, Stafford, Hereford, Monmouth, Gloucester, Warwick (partially), and Northampton; the whole of South Wales, and large districts in North Wales. Additional information is here earnestly requested from all able and willing to communicate it.

Any account of the uses or properties of lichens, or of their applications as dye-stuffs or other ways, in manufactures, food and medicine, is advisedly omitted as beside the object of the present work and belonging rather to the chemist and economical experimentalist.

Nor is notice taken of certain minute conceptacles of fructification of a Sphæria-like aspect and characters occurring parasitically on the thallus and apothecia of certain lichens, such being now regarded by the best authorities as fungilli.

It now only remains to show how the present work should be used. Suppose that a person has collected from some rocks a crustaceous lichen unknown to him (but which for illustration's sake is *Lecidea lactea*) how is he to proceed to its determination. First, he turns to p. 1, and finds that the thallus of his lichen is not gelatinous, consequently is included in Family III. *Lichenacri*. He now refers to this family on p. 2, and running over the characters there given of the different Series finds that the thallus being crustaceous, it must belong to Series V. *Placodci*. To that Series he refers on p. 3, and observing the apothecia of his lichen to be lecideine (i.e. with a dish-like apothecium surrounded by a proper margin of the same colour as the disk or epithecium) at once knows it to be referable to Tribe XV. *Lecideolaci*. Turning to p. 9, where this Tribe is, he now observes the thallus to be crustaceous and areolate, i.e., its upper surface divided into many small adjacent portions or spaces, and also making a thin vertical section through the apothecium, the microscope shows him that the spores are 8, colourless and simple, which convinces him that this lichen belongs to the genus *Lecidea*, one of the most extensive genera among British lichens. Turning now to p. 248, he notices that this great genus contains 233 species besides numerous varieties and forms. To his great delight, however, he finds that this genus is divided into several sections according as the spores are 8 in number, simple or septate; or spores numerous, or the species is parasitical. His lichen having 8 simple spores, and not being a parasitical species, he refers to the section A. *Spores simple*, at p. 249, and this still large section he discovers to be broken up into small groupes of 2, 4, 6, 8 or 10 or 12 species distinguished by the nature and aspect of the thallus. Examining the thallus of his

lichen he sees that it is areolate, and that the areolæ have a flat or plane surface. On p. 283 he finds the group so characterized, and taking another look at the vertical section of the apothecium under the microscope he observes that the hypothecium is dark-coloured; so he refers to p. 287, and then discovers that his choice is limited to 5 species only. Comparing his specimen with the prominent characters printed in italics he observes that it has a whitish or cinerascens, i.e. ashey-grey thallus, smooth and broken-up into areolæ separated from each other by distinct chinks; that the apothecia are black, innate, (i.e. sunken in the thallus), and are either naked or covered with pruina, and his vertical section shows that the apothecium is internally cinerascens and that the hypothecium is of a dark blackish-brown colour. He hesitates not to refer it to *Lecidea lactea* (Flk.) on p. 289, with which all his ascertained and observed characters coincide. But to make certainty as it were more sure, he takes his chemical reagent the hydrate of potash and touches the surface of the thallus with it; immediately it shows a yellow colour which in a few seconds changes to a deep orange-red. This also coincides, and so his determination is concluded, and is accurate.

The author is neither so vain nor so sanguine as to imagine for an instant, that imperfections and errors may not be discovered; perhaps these are inseparable from such a work. The pointing out of these, in a friendly manner and in a courteous spirit will always command his thanks, and his careful consideration. Communications of such and of additional information resulting from the personal observations and researches of the increased and increasing number of students of this interesting branch of botanical science, (which, if they think fit, may be embodied in future editions, or in future supplements), will tend gradually to an accurate and comprehensive knowledge of our insular lichens, and its eventual elevation to a level with that of other branches of our country's Flora.

In conclusion, I would commend to the student the following apt remarks of M. Marc Micheli (Bibliothèque Universelle, Archives des Sciences, tom. xlii, p. 105, Oct. 1871). "In the present state of our knowledge we can scarcely expect brilliant discoveries or works to make a great noise in the world. This may be the case in the infancy of a science; but the task which we have to fulfil is essentially different. Our predecessors have laid down the great principles; and in a general way we may say that science rests upon firm and solid bases, which nothing can overturn. What remains for us is deep and minute investigation; we must not neglect any detail, however minute it may appear. It is only by following this course, which is perhaps more arid and which, from afar, may appear more ungrateful, that the scientific men of the present day will succeed in perfecting the work which has been commenced, and introduce into the sketch which has been handed down to us, the finish of a perfect picture. The principal features of the life of plants are known to us; and we

can nearly follow the different phases of development from the first vital movements of the germinating seed to the moment when the products of vegetation are accumulating in the fruit and thus preparing a new generation. But if the general outlines are known, how many details are still wanting! how many phenomena which escape us, at all events in part! how many questions to be solved!"

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*Fr. L. E.* Fries, *Lichenologia Europæa reformata*, 1831.  
*Fr. Sched. Crit.* Fries, *Schedulæ Criticæ*, 1824—1827.  
*Fr. Scand. Fr. S. V. S.* Fries, *Summa Vegetabilium Scandinaviæ*, 1840.  
*Th. M. Fr. Lich. Arct.* Theodore Magnus Fries, *Lichenes Arctoi*, 1860.  
*Th. M. Fr. Ster.* T. M. Fries, *Monographia Stereocaulorum et Pilophorum*, 1858.  
*Grev. Edin.* Greville, *Flora Edinensis*, 1824.  
*Grev. Scot. Crypt.* Greville, *Scottish Cryptogamic Flora*, 1823—1828.  
*Gouan Montp.* Gouan, *Herborisation de Montpellier*, 1796.  
*Hepp. Wurtz.* Hepp, *Lichenes Flora Wurzburg*, 1824.  
*Hepp. Sporen.* Hepp, *Abbildungen und Beschreibung der Sporen der Flechten Europas*, 1853.  
*Hoffm. En.* Hoffman, *Enumeratio Lichenum*, 1784.  
*Hoffm. Pl. Germ.* Hoffman, *Deutschlands Flora*, 1791.  
*Hoffm. Pl. Lich.* Hoffman, *Plantæ Lichenosæ*, 1799—1801.  
*Hook. Fl. Brit.* Hooker, *British Flora*, 1833.  
*Hook. Fl. Scot.* Hooker, *Scottish Flora*, 1821.  
*Huds. Fl. Angl.* Hudson, *Flora Anglica*, 1762—1778.  
*Harrim.* Harriman, in *Winch Botanists Guide*, 1807.  
*Körb. S. L. G.* Körber, *Systema Lichenum Germaniæ*, 1855.  
*Körb. Par.* Körber, *Parerga Lichenologica*, 1859—1860.  
*Laur. in Sturm.* Laurer, in *Sturm Deutsche Flora*, 1833.  
*Leight. Br. Graph.* Leighton, *Monograph of British Graphideæ*, 1854.

- Leight. Not. Lich.* Leighton, Notuke Lichenologicæ, 1866, et seq.  
*Leight. Ang. Lich.* Leighton, British Angiocarpous Lichens, 1851.  
*Leight. Br. Umb.* Leighton, British Umbilicariæ, 1856.  
*Lightf. Scot.* Lightfoot, Flora Scotica, 1777.  
*Linn. Suppl. Pl.* Linnæus, fil., Systema Plantarum, Supplementum, 1781.  
*Linn. Sp. Pl.* Linnæus, Species Plantarum, 1753.  
*Linn. Syst. Nat.* Linnæus, Systema Naturæ, 1767—1774—1784.  
*Linn. Fl. Succ.* Linnæus, Flora Suecica, 1755.  
*Linn. Mant.* Linnæus, Mantissa, 1767—1771.  
*Linds.* Lindsay, in Transactions Royal Society of Edinburgh, 1857.  
*Link.* Link, in Annal. Botan. 1794.  
*Mack. Hib.* Mackay, Flora Hibernica, 1836.  
*Maun Lich. Boh.* Maun, Lichenum in Bohemia dispositio, 1826.  
*Moris.* Morison, Historia Plantarum, 1699.  
*Mich.* Micheli, Nova Plantarum Genera, 1729.  
*Mass. Neag.* Massalongo, Neogenea Lichenum, 1854.  
*Mass. Ric.* Massalongo, Recherche sull'autonomia dei Lichenum, 1852.  
*Mass. Gen.* Massalongo, Geneacæna Lichenum, 1854.  
*Mass. Symm.* Massalongo, Symmicta Lichenum, 1855.  
*Mass. Sert.* Massalongo, Sertum, 1856.  
*Mudd Man.* Mudd, Manual of British Lichens, 1861.  
*Mont. Lich. Canar.* Montagne, Lichenes Canarienses, 1840.  
*Mont. Syll.* Montagne, Sylloge, 1856.  
*Mont. & Dur.* Montagne and Durieu, Exploration scientifique de l'Algérie, 1846.  
*Mont. Arch.* Montagne, in Archives de Botanique, 1833.  
*Nov. Act. Upsal.* Nova Acta Academiæ Upsaliæ, 1782.  
*Nyl. Coll.* Nylander, Collectanea Galliæ Meridionalis et Pyrenæis, 1853.  
*Nyl. Luxemb.* Nylander, Luxembourg Lichens in Bulletin Soc. Scient. France, 1866.  
*Nyl. in Ofvers.* Nylander, in Ofvers. V. Ak. Forh. 1860.  
*Nyl. En.* Nylander, Enumeration générale des Lichens, 1858.  
*Nyl. Lich. Egypt.* Nylander, Lichenes in Ægypto a cel. Ehrenb. collecti, 1864.  
*Nyl. Nov. Gran.* Nylander, Prodrômus Floræ Novæ Granatensis, 1863—1864.  
*Nyl. Alger.* Nylander, Etudes sur les Lichens de l'Algérie, 1857.  
*Nyl. Delph.* Nylander, circa lichenes alpium Delphinatus obs. 1863.  
*Nyl. Bot. Not.* Nylander, in Botaniska Notiser, 1852—1854.  
*Nyl. Obs. Holm.* Nylander, Observationes ad Synopsin Lichenum Holmiensium, 1852.  
*Nyl. Animad.* Nylander, Animadversiones Scand. in Botaniska Notiser, 1853.  
*Nyl. Addit. Chil.* Nylander, Additamentum in Floram Cryptogamicam Chilensem, 1863.

- Nyl. Armor.* Nylander, Lichenes in Armorica, in Bulletin Societ  Botanique de France, 1861.
- Nyl. in Sallsk.* Nylander, in Sallskapet pro Fauna et Flora F rhandlingar, 1859.
- Nyl. Prodr.* Nylander, Prodromus Lichenographi  Gallici  et Algeri , 1857.
- Nyl. Syn.* Nylander, Synopsis methodica lichenum omnium, tom. 1. 1858.
- Nyl. Scand.* Nylander, Lichenes Scandinavi , 1861.
- Nyl. Lapp. Or.* Nylander, Lichenes Lapponi  orientalis, 1866.
- Nyl. in Flora.* Nylander, in Flora, various years.
- Nyl. Calic.* Nylander, Monographia Caliciorum, 1857.
- Nyl. in Mus. F n.* Nylander, Herbarium Musei Fennici, 1859.
- Nyl. Classif.* Nylander, Essai d'une nouvelle Classification des Lichens, 1854—1855.
- Nyl. Addit. N. Gran.* Nylander, Additamenta ad Floram Nov  Granatensis, 1864.
- Nyl. Chil.* Nylander, Chilenses Flor. Cryptog. 1855.
- Nyl. Pyren.* Nylander, Expositio synoptica Pyrenocarpeorum, 1858.
- Nyl. Arth.* Nylander, Synopsis du genre Arthonia, 1856.
- Neck. Delic.* Necker, Delici  Gallobelgi , 1768.
- Pers. Obs. Myc.* Persoon, Observations Mycologic , 1799.
- Pers. Ust. Ann.* Persoon, in Usteri Annales, 1794-95.
- Pers. Syn.* Persoon, Synopsis Fungorum, 1801.
- Pers. Icon.* Persoon, Icones et Descriptiones Fungorum, 1799.
- Pers. Fung. Suppl.* Persoon, Tentamen Dispositionis Fungorum Supplementum, 1797.
- Poll. Pal. El.* Pollich, Historia Plantarum in Palatinatu Electorali. 1777.
- Rebent. Fl.* Rebent, Flora Neomarchia, 1804.
- Ram. Act.* Ramond, in Acta Societ  Linne ne de Paris, 1827.
- Ram. Fl. Fr.* Ramond, in Decandolle Flore Francaise.
- Sch r. Spic.* Sch rer, Lichenum Helveticorum Spicilegium, 1823-1846.
- Sch r. En.* Sch rer, Enumeratio critica, 1850.
- Sch r. in Nat. Sw.* Sch rer, in Nat. Anz. 1810-1821.  
Swartz, in Linnei filii Methodo Muscorum, 1805.  
Swartz, in Nova Acta Upsali , 1776.  
Swartz, Flora Indi  orientalis, 1806.
- Scop. Carniol.* Scopoli, Flora Carniolica, 1760-1772.
- Sm. in Tr. L. S.* Smith, in Transactions Linnean Society, 1791.
- Schrank Bay.* Schrank, Bayer Flora, 1789.
- Schreb. Spic.* Schreber, Spicilegium Flor  Lipsiensis, 1771.
- Schleich. Cent.* Schleicher, Centuri , 1805-7.
- Steb. Stein. Opeg.* Stizenberger, Conspectus specierum saxicolarum generis Opegraph , 1865.
- Stizb. Flecht.* Stizenberger Beitrag zur Flechten Systematik, 1862.
- Sm f. Lapp.* Sommerfelt Supplementum Flor  Lapponi , 1826.
- Schr d. Spic.* Schr der, Spicilegium Flor  Germanic , 1814.
- Schr d. Crypt.* Schr der, Cryptogam  Exsiccat , 1797.



- Schrad.* Schrader, in Journal Botanique, 1801.  
*Sturm. D. Fl.* Sturm Deutsche Flora. 1833.  
*Salw. Penz.* Salwey, in Transactions Penzance Natural History Society, 1853.  
*Salw. Ed.* Salwey in Transactions Edinburgh Botanical Society, 1846 et seq.  
*Tuck. Sym.* Tuckermann, Synopsis Lichens North America, 1845.  
*Tuck. Suppl.* Tuckermann, Supplement to North American Lichens, 1858—1859.  
*Tul. Mem. Lich.* Tulasne memoire pour servir a l'histoire des lichens, 1852.  
*Tayl. Fl. Hib.* Taylor, in Mackay Flora Hibernica, 1836.  
*T. & B. Lich. Br.* Turner and Borrer, Lichenographia Britannica, 1839.  
*Thunb. Fl. Cap.* Thunberg, Flora Capensis, 1794.  
*Vaill. Paris.* Vaillant, Botanicum Parisiense, 1727.  
*Vahl.* Vahl, in Flora Danica, 1769—1808.  
*Ust. N. Ann.* Usteri, Novæ Annales, 1794.  
*With. Arr.* Withering, Arrangement, 1796.  
*Weis Cr.* Weis, Plantæ Cryptogamicæ Floræ Gottingensis, 1772.  
*Wahlbg.* Wahlenberg, in Vet. Ak Holm, 1806.  
                   Wahlenberg, Flora Suecica, 1826.  
                   Wahlenberg Flora Lapponica, 1812.  
*Wallr. Crypt.* Wallroth, Compendium Floræ Germanicæ, 1831.  
*Weig. Obs.* Weigel, Observationes Botanicæ, 1772.  
*Westr. Faerg.* Westring, Svenska Lafvarnes Farghistoria, 1805.  
*Web. Spic.* Weber, Spicilegium Floræ Gottingensis, 1778.  
*Wulf.* Wulfen, in Jacquin's Collectanea, 1786—1796.  
*Weddell.* Weddell, in Bulletin Societe Botanique de France, 1869.

## LICHENES EXSICCATI QUOTED.

- Anzi It. S.* Anzi, Lichenes Italiæ Superioris.  
*Anzi Venet.* Anzi, Lichenes rariores Veneti.  
*Anzi Langob.* Anzi, Lichenes rariores Langobardi.  
*Anzi Etr.* Anzi, Lichenes rariores Etruriæ.  
*Anzi Clad. Cisalp.* Anzi, Cladoniæ Cisalpinæ.  
*Arn.* Arnold, Lichenes Exsiccati Juræ et al.  
*Bohl.* Böhler, Lichenes Britannici Exsiccati.  
*Bourg.* Bourgeau, Plantæ Canarienses.  
*Breutel.* Breutel, Flora Germanica exsiccata.  
*Coem Clad. Belg.* Coeman, Cladoniæ Belgicæ.  
*Desmaz.* Desmazieres, Cryptogames de France.  
*Dicks.* Dickson, Exsiccati.  
*Fellm.* Fellman, Lichenes Lapponiæ orientalis.  
*Fries.* Fries (E.) Lichenes exsiccati Sueciæ.  
*Th. M. Fr.* Th. M. Fries, Lichenes Scandinaviæ.

<i>Hepp.</i>	Hepp, Die Flechten Europas.
<i>Hampe.</i>	Hampe, Lichenes Exsiccati.
<i>Korb.</i>	Koerber, Lichenes Exsiccati.
<i>Larbal.</i>	Larbalestier, Lichenes Cæsarienses et Sargienses.
<i>Leight.</i>	Leighton, Lichenes Britannici Exsiccati.
<i>Lindig.</i>	Lindig, Lichenes Novæ Granadæ.
<i>M. &amp; N.</i>	Mongeot et Nestler, Stipes Cryptogamæ Vogeso Rhœnanæ.
<i>Mudd.</i>	Mudd, Lichenes Britannici Exsiccati.
<i>Mudd Clad. Brit.</i>	Mudd, Cladonia Britannicæ Exsiccatæ.
<i>Mandon.</i>	Mandon, Maderæ.
<i>Mass.</i>	Massalongo, Lichenes Italici.
<i>Nyl.</i>	Nylander, Herbarium Lichenum Parisiensium.
<i>Rabenh.</i>	Rabenhorst, Lichenes Europæi.
<i>Schær.</i>	Schærer, Lichenes Helvetici Exsiccati.
<i>Spruce &amp; Auz.</i>	Spruce, Lichenes Amazonici et Andini.
<i>Tuck.</i>	Tuckerman, Lichenes Americæ Septentrionalis.
<i>Wright.</i>	Wright, Lichenes Cubæ.
<i>Welw. Lus.</i>	Welwitsch, Lichenes Lusitanici.
<i>Zw.</i>	Zwackh, Lichenes Germanici Exsiccati.

# GLOSSARY OF TERMS

USED IN

## LICHENOLOGY.

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- Abbreviated*, suddenly shortened.  
*Abraded*, roughly rubbed off.  
*Acervuli*, little heaps or clusters.  
*Acicular*, needle-shaped.  
*Aciculari-bacilliform*, needle-like and somewhat club-shaped.  
*Aciculari-cylindrical*, a needle-like cylinder-shape.  
*Aciculari-fusiform*, of an acicular or very slender spindle-shape.  
*Acuminate*, coming gradually to a point.  
*Adnate*, adhering to anything.  
*Adnato-appressed*, adnate and closely pressed to a surface.  
*Adnato-squamulose*, with adnate scales.  
*Adpresso-tomentellose*, with appressed close down.  
*Adscendenti-congested*, crowded together and ascending.  
*Æruginose*, verdigris green.  
*Affixed*, fixed to.  
*Agglomerated*, clustered.  
*Aggregate*, crowded together.  
*Aggregato-acervulate*, in crowded heaps.  
*Aggregato-confluent*, flowing together in crowded portions.  
*Aggregato-conglomerate*, in crowded clusters.  
*Aggregato-deformed*, deformed by being crowded together.  
*Albescent*, growing white.  
*Albican*, growing whitish.  
*Albido-appresso-tomentellose*, with whitish appressed down.  
*Albido-bullate*, whitely bullate.  
*Albido-cinereous*, whitish ashey-grey.  
*Albido-cinerascent*, whitish becoming ashey.  
*Albido-flavescent*, whitish-yellow.  
*Albido-glaucous*, whitish-glaucous.  
*Albido-granulose*, with whitish granules.  
*Albido-pallescent*, pale and whitish.  
*Albido-papillate*, with whitish papillæ.  
*Albido-pruinose*, with white pruina.  
*Albido-radiate*, in whitish radiations.  
*Albido-stramineous*, whitish straw-coloured.  
*Albido-tomentellose*, covered with whitish down.  
*Albo-casio pruinose*, with white bluish-grey pruina.

the surface with a white tomentum.

*Albo-carnæous*, pale flesh-colour.

*Albo-cinereous*, white ashey-grey.

*Albo-depresso-granulate*, covered with white flattened granules.

*Albo-fibriloso-ciliate*, ciliate with white fibrillæ.

*Albo-fluorescent*, pale yellow.

*Albo-flocculose*, with white woolly down.

*Albo-furfuraceous*, with white scurf.

*Albo-fuscescent*, white-brownish hue.

*Albo-granulato-pulverulent*, with white granular powder.

*Albo-granulato-pruinose*, with pruina consisting of white granules.

*Albo-guttate*, spotted with white.

*Albo-limbrate*, bounded by a white hypothallus.

*Albo-maculate*, having white spots or dots.

*Albo-macular*, consisting of a white spot or patch.

*Albo-ocellate*, surrounded with a white thalline margin, giving an eye-like appearance.

*Albo-pruinose*, with white pruina.

*Albo-pulverulent*, having white powder.

*Albo-sorediate*, with white soredia.

*Albo-suffused*, covered with white powder or pruina.

*Albo-tomentose*, with white tomentum.

*Albo-verrucose*, having white warts.

*Albo-virescent*, whitish-green.

*Alcatoroid*, filiform or filamentose, like the thallus of the genus

*Alcatoria*.

*Anastomosing*, uniting in a network.

*Angular*, with many sharp cut straight sides.

*Angulari-areolato-verrucose*, consisting of angular warty areolæ.

*Angulari-nucleolate*, with angular shaped nuclei.

*Anguloso-deformed*, angular and deformed by crowding.

*Anguloso-rimose*, broken into angular portions by clinks.

*Angustissimo-divided*, divided into the very narrowest lacinia.

*Annulari-tomentose*, having a ring of down.

*Apex*, the end or point.

*Apically*, at the apex.

*Apiculate*, terminating abruptly in a little point.

*Apiculi*, minute points.

*Apothecium*, the entire female fructification of a lichen.

*Appendiculate*, an apothecium subtended by the apex of a branch or lacinia extending beyond it.

*Applanate*, flattened out or horizontally expanded.

*Applanato-dilated*, broad and flattened out.

*Appressed*, pressed closely to anything.

*Appresso-furfuraceous*, having appressed scurf.

*Appresso-innate*, closely pressed to, and partially innate or sunken.

*Appresso-spongiosa-tomentose*, having a close pressed spongy tomentum.

*Appresso-tomentose*, with appressed tomentum.

*Approimate*, approaching.

*Arachnoid*, cobwebbed.



*Arachnoido-tomentose*, having a loose tomentum or down hanging about like a cobweb.

*Arcuate*, curved like a bow.

*Arcuato-rugulose*, wrinkled in an arcuate or curved manner.

*Ardella*, the peculiar apothecia in the genus *Arthonia* resembling burnt or cauterized spots.

*Areolato-imbricato-crustaceous*, with overlapping areolæ almost crusty.

*Areolato-impressed*, impressed in the areolæ.

*Areolato-papillate*, divided into papillate areolæ.

*Areolato-rimose*, divided into areolæ by chinks.

*Areolato-squamulose*, consisting of flattened scaly areolæ.

*Areolato-verrucose*, consisting of wart-like areolæ.

*Arthonoid*, of the form and consistence of the apothecia in the genus *Arthonia*.

*Articulate*, jointed.

*Articulato-constricted*, having contracted joints.

*Arthrosterigmata*, jointed sterigmata.

*Ascending*, bending upwards in an upward direction.

*Ascendati-imbricate*, ascending and overlapping.

*Asci*, small hyaline bladders containing the spores.

*Ascyphous*, without scyphi or cups.

*Atrocinerascent*, black or dark ashey-grey.

*Atro-rhizinose*, having black rhizinae.

*Atro-rufous*, dark and blackish-red.

*Attenuate*, tapering upwards and becoming thin.

*Attenuato-fusiform*, slenderly spindle-shaped.

*Attenuato-subulate*, tapering upwards into an awl-shaped form.

*Aurantiaeo-ochraceous*, of an orange ochrey colour.

*Axil*, the fork of a branch.

*Bacillar*,  
*Bacilliform*, } club-shaped.

*Radious*, dull brown.

*Radio-castaneous*, dull dark chestnut.

*Radio-fuscescent*, dull dark brownish color.

*Radio-fuscous*, dull dark brown.

*Radio-pallescent*, dull pale brown.

*Radio-rufescent*, dull reddish brown.

*Radio-rufous*, dull dark red-brown.

*Radio-umbrine*, of a dull dark umber colour.

*Biatorine*, from Fries's genus *Biatora*, in which the apothecium had a proper margin of a different color to the epithecium, or was convex without visible margin, and internally with a pale or colourless hypothecium.

*Biatorino lecidine*, an apothecium becoming convex and destitute of margin either proper or thalline.

*Bifurcate*, twice forked.

*Bilocular*, having two cells cut as it were out of a solid spore in contradistinction to 1-septate.

*Binucleolate*, with two nuclei.

*Branched*, in contradistinction to simple or unbranched.

*Brunneo-fuscous*, dull brown.

*Brunneo-infusate*, dull darkish-brown.

*Bullate*, with unequal convex projections on the under surface of a serobiculate thallus, corresponding to the concave serobiculations on the upper surface.

*Bullato-plicate*, plaited into swollen masses.

*Bullato-reticulato-tomentose*, bullate in a reticulate manner, the reticulations being downy.

*Byssoid*, of a finely filamentous structure like the genus *Byssus*.

*Cærulescent*, of a blue colour, variable in intensity.

*Cærulescenti-fuscescent*, bluish-brown.

*Cæruleo-cinerascent*, blue ashey-grey.

*Cæruleo-fuscescent*, bluish-brown.

*Cæruleo-nigricant*, of a bluish-black colour.

*Cæruleo-pruinose*, with blue pruina.

*Cæruleo-virescent*, bluish-green.

*Cæsius*, bluish-grey.

*Cæσιο-cinerascent*, blue-grey passing into ashey-grey.

*Cæσιο-nigricant*, greyish-black.

*Cæσιο-pruinose*, having bluish-grey pruina.

*Cæσιο-pulverulento-sorediöse*, having greyish powdery soredia.

*Cæσιο-sorediate*, with greyish soredia.

*Cæσιο-suffused*, covered with grey pruina.

*Cæsius-white*, greyish-white.

*Cæspitellöse*, of a minute clustered branched conglomerate form.

*Cæspitöse*, in clustered branched agglomerations.

*Cæspitoso-congested*, in crowded tufts.

*Cæspitoso-fruticulöse*, in shrub-like tufts.

*Cæspitoso-pulvinular*, in dense tufted cushion-like masses.

*Calcivorous*, eating into the lime rock.

*Canaliculate*, longitudinally channelled or furrowed.

*Canaliculato-laciniate*, channelled and laciniate.

*Canaliculato-patulous*, channelled but still spreading outwards.

*Canellato-insculpted*, sculptured in a kind of reticulation.

*Canescent*, hoary.

*Capillary*, delicately filiform or like hairs.

*Capitate*, formed into a head.

*Capitulum*, the portion of the apothecium in the genus *Calicium* which is on the top of the stipes.

*Capituliform*, having a capitulum or head.

*Carbonaceous*, black like charcoal.

*Carioso-canellate*, decayed in a network manner.

*Carneo-cinerascent*, greyish-flesh-coloured.

*Carneo-fulrescent*, tawny flesh-coloured.

*Carneo-fuscescent*, brownish flesh-colour.

*Carneo-pallid*, pale flesh-coloured.

*Carneo-rufescent*, pale reddish flesh color.

*Carneo-rufous*, reddish flesh-coloured.

*Carneo-testaceous*, yellowish-brown flesh-coloured.

*Cartilaginous*, hard or tough like a cartilage or sinew.

*Cartilagineo-corticati*, having the cortical layer of a cartilaginous consistence.

- Cartilagineo-membranaceous*, of a consistence intermediate between cartilaginous and membranous.
- Cartilagineo-squamosæ*, the squamæ of a thallus being of a tough cartilaginous consistence.
- Castaneo-fuscescent*, pale chestnut-brown.
- Castaneo-fuscous*, of a dark chestnut-brown.
- Castaneo-olivaceous*, of a chestnut-brown olive-colour.
- Castaneo-nigricant*, chestnut-black.
- Castaneo-rufescent*, chestnut-brown with a reddish tinge.
- Cellulose*, consisting of cellules.
- Cephalodia*, granular concretions of an orbicular form occurring on the thallus, composed internally of granula gonima.
- Cephaloid*, having a globose or hemispherical head.
- Cephalodine*, forming a head.
- Ceraceo-gelatinose*, waxy and gelatinous.
- Ceraceo-membranaceous*, consisting of a waxy membrane.
- Cerasino-rufescent*, cherry-red.
- Cervine*, dark tawny.
- Cervino-castaneous*, dark tawny chestnut-brown.
- Cervino-fuscescent*, tawny-brownish.
- Cervino-lutescent*, tawny yellowish.
- Cervino-rufescent*, tawny reddish.
- Chroolepoid*, consisting of minute yellow scales.
- Ciliato-dentate*, toothed with ciliæ or hairs.
- Ciliato-dissected*, cut into ciliæ or hair-like laciniæ.
- Cinerascent*, approaching an ashey-grey colour.
- Cinerascenti-fuscescent*, of an ashey-grey brownish hue.
- Cinereous*, ashey-grey.
- Cinereo-albescent*, ashey-grey becoming whitish.
- Cinereo-carneous*, of an ashey-grey flesh-colour.
- Cinereo-carrulescent*, ashey grey verging towards blue.
- Cinereo-ferruginous*, ashey rust colour.
- Cinereo-flavescent*, ashey-grey yellow.
- Cinereo-fuscescent*, ashey-brown.
- Cinereo-glaucouscent*, glaucous ashey-grey.
- Cinereo-glaucous*, ashey-grey glaucous hue.
- Cinereo-lurid*, of a dull ashey hue.
- Cinereo-nigrescent*, ashey-blackish.
- Cinereo-nigricant*, ashey-black.
- Cinereo-pallescent*, pale ashey.
- Cinereo-pruinose*, with ashey-grey pruina.
- Cinereo-rufescent*, ashey-reddish.
- Cinereo-suffused*, covered with ashey-grey powder or pruina.
- Cinereo-virescent*, ashey-green.
- Cinnamomeo-cinerascent*, cinnamon greyish.
- Circumcised*, applied to an apothecium which is separated from the thallus by a distinct rima or chink.
- Circumference*, the exterior edge or margin of a thallus.
- Circumscribed*, defined.
- Citrine*, yellow-green.
- Citrino-flavescent*, yellow like a lemon.

- Citrino-pulverulent*, having powder of a citrine colour.
- Citrino-sorediate*, having citrine soredia.
- Citrino-suffused*, covered with citrine powder.
- Citrino-virescent*, yellow-green as in a lemon.
- Claviform*, club-shaped.
- Clavate*, club-shaped.
- Clavato-capitate*, with a head or apex of a club-shaped or wedge-shaped form.
- Clavato-cylindrical*, elongated club-shaped.
- Clavato-pyriform*, of club-shaped or elongate pear-shape.
- Coarctate*, closely pressed.
- Colliculoso-verrucose*, in hilly or elevated verrucæ.
- Colourless*, without colour, pale and hyaline, in contradistinction to brown.
- Compact*, closely united together.
- Complicate*, folded or plaited together.
- Complicato-compound*, apothecia becoming compound by close confluence or by complications of the margin.
- Compressed*, laterally flattened.
- Concatenate*, united in a chain-like manner.
- Concave*, with a more or less depressed or sunken rounded surface.
- Concentric*, ring within ring having a common centre.
- Concentrically-gyrose*, whirled or gyrose, ring within ring.
- Conceptacle*, receptacle.
- Concolorous*, similar in colour.
- Concreserenti-areolate*, the areolæ growing together in a somewhat clustered form.
- Concrete*, growing together.
- Confluent*, merging into each other.
- Confluente-effuse*, spread out in a conjoined or confused condition.
- Congested*, heaped together.
- Conglobate*, in rounded clusters.
- Conglomerate*, clustered.
- Conglomerations*, clusters.
- Conglomerato-deformed*, becoming deformed by being clustered or crowded.
- Conglomerato-granulose*, of clustered granules.
- Conglutinated*, glued together.
- Connate*, arranged together.
- Connato-deformed*, deformed by growing in close contact.
- Connivent*, arching over as if to meet.
- Conoid*, conelike.
- Conoideo-subtruncate*, like a truncate or flattened cone.
- Constricted*, contracted.
- Contiguous*, a continuous surface.
- Continuus*, having an unbroken surface.
- Contorted*, twisted together.
- Converging*, tending towards one common centre or point.
- Convex*, with a more or less elevated rounded surface.
- Convexo-conical*, convex with a conical apex.
- Convexo-gibbous*, convex and enlarged on one side.



- Convexo-unequal*, of unequal convexity.  
*Coralloid*, coral-like.  
*Coralloideo-granuloso-crustaceous*, of a crustaceous consistence formed of coral-like granules.  
*Coralloideo-squamulose*, squamæ of a coralloid form.  
*Coriaceous*, of a leathery consistence.  
*Coriaceo-membranaceous*, like a leathery membrane.  
*Corniculato-convolute*, rolled together inwards like a little horn.  
*Corneous*, of horny consistence.  
*Corneo-hyaline*, transparent like horn.  
*Cornute*, shaped like a horn.  
*Corrugate*, roughened with wrinkles.  
*Cortex*, the cortical layer.  
*Cortical layer*, the epidermis of a thallus.  
*Corticate*, covered with a cortical layer.  
*Crenate*, having shallow rounded divisions on the margin.  
*Crenato-dentate*, with crenate teeth.  
*Crenato-granulose*, having shallow rounded marginal divisions composed of granules.  
*Crenato-incised*, deeply cut in a crenate form.  
*Crenato-lobulate*, with minute crenate lobes.  
*Crenato-rugose*, crenate and wrinkled.  
*Crenato-undulate*, crenate and wavy.  
*Crenulate*, having very minute shallow rounded marginal divisions.  
*Crenulato-denticulate*, with minute crenulate teeth.  
*Crenulato-granulate*, having minute shallow rounded marginal divisions composed of granules.  
*Crenulato-lobate*, lobed in minute rounded marginal divisions.  
*Cretaceous*, chalky-white.  
*Crispate*, crisped.  
*Crisped*, irregularly curled and twisted.  
*Cristato-ramose*, crested and branched.  
*Croceo-fulvous*, tawny saffron-coloured.  
*Crowded*, clustered, or many together.  
*Crustaceous*, hard, thin, and brittle.  
*Crustaceous*, applied to a thallus which is closely appressed to the substance on which it grows in contradistinction to membranaceous.  
*Crustaceo-cartilaginous*, between crustaceous and cartilaginous.  
*Crustaceo-concrescent*, growing together into a crust.  
*Crustaceo-granulose*, a crustaceous thallus composed of distinct granules.  
*Crustaceo-imbricate*, squamæ of a crustaceous consistence overlapping each other.  
*Crustose*, forming a crust.  
*Cucullato-revolute*, rolled back into a cowl shape.  
*Cupular*, cup-shaped.  
*Cupuliform*, like a little cup.  
*Cuspidate*, abruptly pointed.  
*Cyathiform*, cup-shaped like a reversed cone.  
*Cyathoid*, like a cup or a reversed cone.

*Cylindrical*, having a true cylindrical figure like a pipe.

*Cylindrico-acicular*, cylindrically needle-shaped.

*Cylindraceo-fusiform*, a cylindrical form tapering to a point at both ends.

*Cylindraceo-oblong*, narrow oblong.

*Cephalote*, minute sunken roundish cup-like spots on the under surface of the thallus of the *Stictol*.

*Cephalote*, minute urceolate excavations on the under surface of the thallus.

*Dactylo-papillate*, consisting of papillæ which are divided like fingers.

*Decorticate*, deprived of the cortical layer.

*Decumbent*, reclining on the earth and rising again from it at the apex.

*Decussate*, alternately crossing each other.

*Dehiscent*, ruptured or split open.

*Dehiscens*, rupturing.

*Deliquescent*, dissolving.

*Dendritical*, branched like a tree.

*Denigrate*, blackened.

*Dentate*, toothed.

*Dentato-radialis*, with minute teeth spreading in a ray-like manner.

*Denticulate*, with minute teeth.

*Denticulato-cristate*, crested with minute teeth.

*Denticulato-dilated*, expanded at the toothed margin.

*Denticulato-laciniate*, laciniate or cut into minute teeth.

*Denticulato-ruptured*, ruptured in tooth-like fashion.

*Denticulato-stellate*, minute teeth spreading in a star-like manner.

*Deplanate*, flattened or expanded.

*Depressed*, pressed down or flattened.

*Depresso-adnate*, depressed and closely adhering.

*Depresso-areolate*, divided into flattened areolæ.

*Depresso-concave*, depressed into a concave hollow.

*Depresso-convex*, flattened convex.

*Depresso-granulate*, covered with flattish granules.

*Depresso-hemispherical*, hemispherical and depressed or flattened on the apex.

*Depresso-implexed*, entangled in a depressed or flattened manner.

*Depresso-pulvinate*, composed of depressed or flattened cushion-like masses.

*Depresso-verrucaroid*, like depressed warts.

*Determinate*, definite in contradistinction to *effuse*.

*Dichotomous*, having the divisions always in pairs.

*Diffuent*, dissolving.

*Difformed*, deformed.

*Difformi-lobate*, lobed in an irregular or deformed manner.

*Diffract*, broken into distinct areolæ separated by chinks.

*DiffRACT-insculpt*, a surface broken up and sculptured.

*DiffRACT-inequal*, unequally broken up.

*Diffuse*, spreading in an indeterminate way.

*Diffuso-macular*, consisting of a diffuse or expanded irregular blotchy patches.

- Digitate*, divided like the fingers of the human hand.  
*Digitato-dentate*, with finger-like teeth.  
*Digitato-lobate*, in finger-like lobes.  
*Digitato-multifid*, cut into numerous finger shaped laciniae.  
*Digitato-partite*, divided into finger-like divisions.  
*Dilated*, expanded or spread out horizontally.  
*Dilatato-compressed*, dilated and compressed.  
*Diluto-nigrescent*, pale washy blackish.  
*Dimidiate*, applied to a perithecium which covers only the upper half of the apothecium as in some species of *Verrucaria*.  
*Dirimid*, like the apothecium in the genus *Dirina* see *tuberculoso-lecanorine*.  
*Disciformi dilated*, dilated or expanded into a disk-like form.  
*Discoid*, disk-like.  
*Discolorous*, of a different colour.  
*Discrete*, separate and distinct.  
*Dispersed*, scattered.  
*Disperso-areolate*, consisting of scattered areolæ.  
*Disperso-glebucose*, in dispersed portions like crumbs.  
*Disperso-granulate*, with scattered granules.  
*Disperso-verrucoso-areolate*, consisting of scattered verrucose areolæ.  
*Dissected*, cut.  
*Dissecto-fimbriate*, cut into a fringed margin.  
*Disticho-ramose*, branched on opposite sides or margins.  
*Distinct*, easily discernible as applied to the paraphyses.  
*Divaricate*, spreading in opposite directions.  
*Divaricato bifid*, cut into two parts and each of those parts spreading in opposite directions.  
*Divaricato-fibrillose*, fibres spreading divaricately.  
*Divaricato-lobate*, lobes spreading in a divaricate manner.  
*Divaricato-multifid*, cut into many divaricating laciniae.  
*Divaricato-ramose*, branched in a divaricate manner.  
*Divaricato spinulose*, minutely spiny, the spines spreading in opposite directions.  
*Divergent*, spreading outwards from a common centre.  
*Divergenti-furcate*, forked, the parts being divergent.  
*Ecrustaceous*, destitute of thallus.  
*Ecyphellate*, without cyphellæ.  
*Effigurate*, having a distinct form or figure.  
*Effigurato-dendritic*, in tree-like branchlets or forms.  
*Effuse*, spread out in an indeterminate way.  
*Efoliolose*, without leaflike scales or squamæ.  
*Egranulose*, without granules.  
*Electrino-fuscescent*, amber-colored brownish.  
*Elevated*, raised above a surface.  
*Elevato-convex*, convex and uplifted.  
*Elevato-sessile*, upraised and sessile.  
*Ellipsoid*, approaching the form of an ellipsis.  
*Elongate*, lengthened in a longitudinal direction.  
*Elongato-acicular*, lengthened needle shaped.



- Elongato-cylindrical*, like a lengthened cylinder.
- Elongato-fusiform*, lengthened spindle-shape.
- Elongato-granulate*, composed of elongate granules.
- Elongato-laciniate*, with very long laciniae.
- Elongato-lobate*, having lengthened lobes.
- Elongato-pendulous*, hanging downwards in a lengthened state.
- Elongato-ramose*, with lengthened branches.
- Emergent*, protruded through the cortical layer.
- Emersed*, protruded upwards.
- Emerso-adnate*, protruded upwards and closely pressed to.
- Endocarpoid*, applied to apothecia which are sunk or innate in the substance of the thallus, similar to those in the genus *Endocarpus*.
- Endococcoid*, internal contents becoming red with iodine; or from the minute globular apothecia like those of the genus *Endococcus*, *Nyl.*
- Entire*, as applied to an apothecium in which the perithecium or hypothecium wholly subtends the hymenium, or to the margin of an apothecium which is continuous and unbroken.
- Epiphyllous*, existing superficially on the epidermis of bark.
- Episporium*, the outer coat of the spores.
- Epithallus*, cortical layer.
- Epithecium*, the expanded colored disk of the apothecium in most genera, or the terminal pore in the perithecium of the genera *Verrucaria*, *Thelotrema*, and *Astrothelium*.
- Epruinose*, without pruina.
- Eroso-crenate*, crenate as if gnawed.
- Eroso-laciniate*, as it were gnawed into laciniae.
- Eroso-lacunose*, with lacunae formed as it were by gnawing.
- Erumptent*, bursting upwards from beneath the cortical layer.
- Erumptenti-innate*, sunken in and bursting forth.
- Evanescent*, deficient or disappearing.
- Even*, smooth.
- Evernoid*, of similar substance and form to the thallus in the genus *Evernia*.
- Excipulum*, receptacle.
- Excluded*, obliterated.
- Expanded*, spread out.
- Explanate*, spread out in the same plane.
- Farinaceous*, chaffy.
- Farinose*, mealy.
- Fasciculate*, collected into small bundles.
- Fasciculato-ramose*, branched in bundles.
- Fastigate*, rising upwards together to the same plane or level.
- Ferruginous*, rust colour.
- Ferruginous-red*, rust-coloured red.
- Fertile*, bearing fructification.
- Fibrillæ*, minute fibre-like branches.
- Fibrillose*, consisting of small fibres.
- Fibrilloso-byssine*, of a fibrous or filamentose nature.
- Fibrilloso-ciliate*, ciliated with minute fibres.

- Fibrilloso-ramulose*, with small slender fibrous-like branches.  
*Fibrilloso-ramosule*, with small fibrous branchlets.  
*Filamenta ostiolaria*, delicate colorless filaments which line the internal portion of the perithecium of *Verrucaria* immediately around the pore-like epithecium.  
*Filamentose*, consisting of thin threadlike filaments or divisions.  
*Filiform*, thread-like or filamentous.  
*Filiformi-terete*, very slender or thread-like and rounded in a longitudinal direction.  
*Fimbriate*, fringed.  
*Firm*, almost rigid.  
*Fissure*, a crack or ruptured opening.  
*Fissured*, split.  
*Fistulose*, hollow like a pipe.  
*Flabelliformi-lobate*, lobed in a fan-shaped mode.  
*Flaccid*, flabby.  
*Flavescent*, growing yellow.  
*Flavican*, yellow.  
*Flavicanti-sulphureous*, yellowish passing into sulphur-colour.  
*Flavido-cinerascent*, yellowish ashey-grey.  
*Flavido-fuscescent*, yellowish-brown.  
*Flavido-ochraceous*, ochrey yellow.  
*Flavido-rufescent*, yellowish-red.  
*Flavo-albican*, yellowish white.  
*Flavo-cinerascent*, yellow ashey-green.  
*Flavo-fuscescent*, yellow growing brown.  
*Flavo-pallescent*, palish-yellow.  
*Flavo-pulverulent*, covered with yellow powder.  
*Flavo-sorediate*, with yellow soredia.  
*Flavo-virescent*, yellow-green.  
*Flavo-viridi-pruinose*, covered with a yellowish-green pruina.  
*Flavo-viridi-suffused*, covered with a yellow-green powder.  
*Flexuose*, wavy.  
*Flocculose*, like wool.  
*Flocculoso-pulverulent*, covered with powdery wool-like tufts.  
*Foliaceous*, like an expanded leaf or membrane.  
*Foliaceo-squamulose*, with leafy squamules.  
*Follicolous*, growing on the leaves of a tree.  
*Foliolose*, consisting of minute leaf-like squamæ or scales.  
*Foreign*, applied to a lichen growing parasitically on another (or foreign) thallus not its own.  
*Fornicate*, arched.  
*Foveolate*, having deep pits or depressions.  
*Foveolato-immersed*, in sunken pits or small depressions.  
*Fragile*, easily broken off.  
*Frondose*, foliaceous or in leaf-like expansions.  
*Frondoso-dilatate*, dilated foliaceous.  
*Fructification*, the apothecium and its contents, viz, asci containing spores, and paraphyses.  
*Fruticose*, shrub-like.  
*Fruticulose*, minutely shrub-like.

*Fruticuloso-erect*, growing erect like a little shrub.

*Fruticuloso-imbricate*, shrub-like, the branches overlapping.

*Fruticuloso-ramose*, branched like a little shrub.

*Fuciformi-branched*, with flattened branches like a fucus or sea-weed.

*Fucoid*, of the nature or similitude of a fucus or sea-weed.

*Fuliginous*, sooty or brown verging on black.

*Fuliginoso-furfuraceous*, having chaff of a dark smoke-black hue.

*Fuliginco-fuscous*, blackish-brown.

*Fulvescent*, tawny.

*Fulvo-testaceous*, tawny yellow-brown.

*Furcate*, forked.

*Furcato-divided*, divided in a fork-like way.

*Furcellate*, minutely forked.

*Furfuraceous*, chaffy.

*Furfuraceo-conerescens*, growing together in a scurfy manner.

*Furfuraceo-diffract*, broken up into scurf.

*Furfuraceo-granulose*, like scurfy granules.

*Fuscescent*, tending to become fuscous or brown.

*Fuscous*, of a dark brown colour.

*Fuscous-black*, dark brown black.

*Fusco-cellulose*, consisting of brown cellulæ.

*Fusco-cinereuscent*, brown-greyish.

*Fusco-cinereous*, brown ashey-grey.

*Fusco-glaucouscent*, glaucous dark-brown.

*Fusco-griseous*, brownish-grey.

*Fusco-livescens*, brown becoming clouded or paler.

*Fusco-nigrescent*, brown growing black.

*Fusco-nigricans*, brownish-black.

*Fusco-obscure*, clouded with fuscous colour.

*Fusco-olivaceous*, brown-olive.

*Fusco-pallescent*, brown growing paler.

*Fusco-rufescent*, dark-brownish-red.

*Fusco-rufous*, dark-red-brown.

*Fusco-virescent*, brownish-green.

*Fusiform*, spindle-shaped.

*Fusiformi-bacillar*, fusiform at one end, club-shaped at the other.

*Fusiformi-cylindrical*, a cylindrical form tapering to and more or less pointed at each end.

*Fusiformi-ellipsoid*, broadly fusiform.

*Fusiformi-incrassate*, thickened into a spindle-shape.

*Fusiformi-oblong*, very broadly fusiform.

*Fusiformi-turgid*, swollen into a spindle-shaped form.

*Gelatina hyemica*, a gelatinous substance surrounding the asci and paraphyses, which becomes tinged blue or vinous-red or without reaction on the application of an aqueous solution of iodine.

*Gelatinoso-conglutinate*, glued together by gelatine.

*Gibboso-convex*, unequally tumid or convex.

*Gomidia*, simple spherical cells containing green granular matter, situate immediately under the cortical layer of the thallus.



*Gonidial stratum*, the stratum consisting of gonidia or granula gonima, immediately underneath the cortical layer of the thallus.

*Glabrous*, smooth.

*Glaucouscent*, greyish-blue or glaucous-green.

*Glaucous-green*, green like the sea or like a carnation leaf.

*Glaucous-albescent*, glaucous growing white.

*Glaucous-cærulescent*, glaucous-blue.

*Glaucous-cinerascent*, glaucous ashey-grey.

*Glaucous-flavescent*, glaucous yellow.

*Glaucous-fuscescent*, glaucous brown.

*Glaucous-olivaceous*, of a glaucous olive colour.

*Glaucous-pallescent*, pale glaucous.

*Glaucous-pruinose*, having glaucous pruina.

*Glaucous-rufescent*, glaucous-reddish.

*Glaucous-virescent*, bluish-green.

*Glebulæ*, crumb-like masses.

*Glebuloso-diffract*, broken up into crumb-like portions.

*Glebuloso-squamosæ*, having scales of a crumb-like appearance.

*Globose*, round or globular.

*Globoso-lenticular* or *lentiform*, globular lens-shaped.

*Globoso-obovate*, of a roundish obovate form.

*Globoso-ovoid*, of a broad rounded egg shape.

*Globoso-pulverulent*, a globe covered with powder.

*Globoso-truncate*, a globe depressed above.

*Globoso-turbinatæ*, of a rounded top-shaped form.

*Globoso-verrucosæ*, consisting of globose verrucæ or warts.

*Glomerules*, clusters.

*Glomeruli*, clusters.

*Glomeruliferous*, bearing clusters of minutely branched coral-like excrescences.

*Glomerulose*, minutely clustered.

*Glomerato-deformed*, deformed by being crowded in clusters.

*Glypholecine*, impressed or canaliculate in an elongate wavy and labyrinthine mode like the genus *Glyphis*.

*Graniform*, like granules.

*Granoso-crenate*, having granular crenations.

*Granula gonima*, clusters of 2, 3, or more sphaerical naked (or without outer membrane) cells, filled with green granular matter situate immediately under the cortical layer of the thallus.

*Granulate*, same as *granulose*.

*Granulato-areolate*, applied to a thallus divided into areolæ or spaces of a granular form.

*Granulato-areolato-rimose*, separated by chinks into granular areolæ.

*Granulato-conglomerate*, granular and clustered.

*Granulato-corrugate*, corrugate or roughened with granules.

*Granulato-crenate*, with granular crenations.

*Granuloso-crispate*, crisped and granulose.

*Granulato-crustose*, having a granular crust.

*Granulato-dispersed*, consisting of scattered granules.

- Granulato-furfuraceous*, having granular scurf.  
*Granuloso-lobulate*, minute lobes formed of granules.  
*Granulato-papillate*, having papillate granules.  
*Granulato-plicato-squamulose*, consisting of minute granular plaited squamules.  
*Granulato-pulveraceous*, powdery with minute granules.  
*Granulato-rugose*, wrinkled with granules.  
*Granulato-rugulose*, minutely wrinkled with granules.  
*Granulato-scabrous*, rough with granules.  
*Granulato-squamulose*, composed of granular squamules.  
*Granulato-subareolate*, granular, the granules becoming areolate.  
*Granulato-sub-pulverulent*, granular and somewhat powdery.  
*Granulato-unequal*, unlevel with granules.  
*Granulato-verrucose*, granulate with warts.  
*Granulose*, consisting of minute granules.  
*Granuloso-concrecent*, granules growing together in a conglomerate manner.  
*Granuloso-concrete*, granules closely growing together.  
*Granuloso-congested*, having granules heaped together.  
*Granuloso-crustaceous*, a crustaceous thallus arranged in granules.  
*Granuloso-diffract*, granules broken up into areolæ or clusters.  
*Granuloso-leprose*, with granular scurf.  
*Granuloso-pulverulent*, powdery with minute granules.  
*Granuloso-squamiform*, granules assuming the form of squamæ.  
*Granuloso-unequal*, surface made unlevel by granules.  
*Granuloso-verrucæform*, wartlike granules.  
*Gregarious*, clustered or crowded.  
*Griseo-nigricant*, greyish-black.  
*Griseo-pallescent*, pale grey.  
*Gyalectiform*, urceolate like a *Gyalecta*.  
*Gyalectine*, applied to urceolate apothecia which are of a waxy or marmoreous appearance and consistence as in the old genus *Gyalecta*, now incorporated in *Lecidea*.  
*Gyalectoid*, see *Gyalectine*.  
*Gymnotremoid*, a naked open spot or space.  
*Gyrose*, concentrically twisted or plaited.  
*Gyrose*, as applied to the peculiar and complicated flexuosities of the margin of the apothecia in the genus *Umbilicaria*.  
*Gyroso-complicate*, plaited in a gyrose way.  
*Gyroso-plicate*, plaited in a gyrose manner.  
*Hemispherico-conoid*, hemispherical with a conical apex.  
*Hemispherico-tuberculose*, consisting of hemispherical minute tubercles.  
*Hispido-spinuloso-denticulate*, bristled with very minute spine-like teeth.  
*Horizontal*, in contradistinction to erect.  
*Horny*, of a horn like consistence.  
*Hyaline*, transparent like glass.  
*Hymenium*, the whole internal portion of the apothecium, consisting of paraphyses, asci and spores and gelatina hymenæa.  
*Hymenular*, inhabiting the hymenium.

- Hypophkeodul*, existing beneath the epidermis of bark.  
*Hypothallus*, the coloured mycelium-like stratum immediately underneath and upon which the thallus grows.  
*Hypothecium*, the internal portion of the apothecium immediately under the hymenium.  
*Imbedded*, sunk somewhat in the thallus.  
*Imbricate*, overlapping each other.  
*Imbricato-congested*, crowded together and overlapping.  
*Imbricato-crustaceous*, so closely imbricated as to become crustaceous.  
*Imbricato-decumbent*, decumbent and overlapping.  
*Imbricato-intricate*, overlapping and entangled.  
*Imbricato-lobate*, lobes overlapping each other.  
*Imbricato-squamose*, having overlapping scales.  
*Immarginate*, applied to apothecia in which the proper margin is obliterated.  
*Immersed*, sunk or plunged in the thallus.  
*Imperforate*, entire without perforation.  
*Implexo-ramose*, branches interwoven.  
*Impressed*, pressed into.  
*Incano-granuloso-pulverulent*, having a hoary granular powder.  
*Incano-tomentellose*, with a hoary down.  
*Incavato-immersed*, sunk in excavations of the rock.  
*Incised*, cut into.  
*Inciso-crenate*, having deeply cut crenations.  
*Inciso-crenulate*, deeply cut into minute crenate lobes.  
*Inciso-lobate*, with deeply cut lobes.  
*Incrassate*, thickened.  
*Incrusting*, forming a crust over a thing.  
*Incurved*, curved inwards.  
*Indeterminate*, unlimited or indefinite.  
*Indistinct*, as applied to paraphyses not separated or easily discernible.  
*Inflated*, puffed out.  
*Inflexed*, bent inwards.  
*Infundibuliform*, funnel-shaped.  
*Infusate*, of a brown colour.  
*Innate*, sunk or imbedded in the thallus.  
*Innato-appressed*, innate and closely pressed to.  
*Innato-emergent*, innate and protruded upwards.  
*Innato-erumpent*, innate and bursting forth.  
*Innato-granulate*, a surface minutely sunken or impressed so as to produce granules.  
*Innato-impressed*, pressed and sunken in.  
*Innato-sessile*, sessile and partially innate.  
*Innately-sessile*, partially imbedded.  
*Inner tunic*, a membrane more or less coloured which surrounds the nucleus or hymenium in the genus *Verrucaria* situated immediately beneath the perithecium.  
*Isidiiferous*, bearing isidiose excrecences.  
*Isidiose*, having powdery coral-like excrecences.
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*IsidiOSO-furfuraceous*, covered thickly with chaffy isidia or papillate excrescences.

*IsidiOSO-scabrous*, roughened with isidiOSE excrescences.

*Insculpt*, imbedded in the rock.

*Iterato-proliferous*, repeatedly proliferous.

*Interstitial*, intervening.

*Intricate*, entangled together.

*Intricato-cæspitose*, in entangled tufts.

*Intricato-flexuose*, wavy like a labyrinth.

*Intricato-ramose*, branched in an entangled fashion.

*Lacerate*, torn.

*Lacero-dehiscant*, gaping or opening in a torn or lacerate manner.

*Lacero-dissected*, cut in a torn manner.

*Lacero-laciniate*, laciniae irregularly divided or torn.

*Lacero-lobate*, torn into lobes.

*Lacunæ*, depressions.

*Læte-virescent*, bright green.

*Laciniate*, cut into narrow linear portions.

*Laciniato-effigurate*, arranged in conspicuous laciniae.

*Laciniato-fibrillose*, consisting of fibre-like laciniae.

*Laciniato-foliolose*, leaf-like laciniae.

*Laciniato-lobate*, thallus divided into deeply-cut narrow laciniae or lobes.

*Laciniato-multifid*, cut into numerous laciniae.

*Laciniato-ramose*, branched in a laciniate manner.

*Laciniiform*, of the form of laciniae.

*Laciniolate*, consisting of very minute laciniae.

*Laciniolæ*, very minute laciniae.

*LaciniOSE*, split into laciniae.

*Lacunose*, having shallow depressions or excavations.

*Lacunoso-canaliculate*, channelled in interrupted depressions.

*Lacunoso-corrugate*, wrinkled and lacunose.

*Lacunoso-impressed*, impressed with sunken depressions.

*Lacunoso-rugose*, wrinkled into lacunæ.

*Laminæ*, membranous strata.

*Lanceolate*, narrowly elliptical, tapering to each end.

*Lanceolato-linear*, narrowly and parallelly lance-shaped.

*Latral*, on the side or margin of a thallus or apothecium.

*Lecanorine*, resembling the apothecium of the genus *Lecanora* which has a paler margin composed of or arising from the thallus.

*Lecideiform*, like the apothecium of a *Lecidea*, same as *lecidine*.

*Lecidine*, resembling the apothecium of the genus *Lecidea*, which has a proper margin of the same colour with the disk or apothecium.

*Lenticular*, like a small lens.

*Leprose*, scurf-like.

*Leproso-gelatinous*, semfy and gelatinous.

*Leproso-granulate*, granules of a scurf-like nature.

*Leproso-granulose*, with scurfy granules.

*Leproso-pulverulent*, having scurfy powder.



*Leproso-tartarcous*, scurfy, rough and crumbling.

*Ligulate*, strap-shaped, narrow with the two opposite margins parallel.

*Limitate*, limited or bounded by a distinct line of hypothallus.

*Linear*, narrow, with the two opposite margins parallel.

*Lineari-confluent*, becoming confluent in linear shapes, or running into continuous lines.

*Lineari-dissecto-fimbriate*, cut into a linear fringed margin.

*Lineari-elongate*, an extended linear form.

*Lineari-laciniose*, cut into linear laciniae.

*Lineari-multipartite*, divided into numerous linear segments.

*Lineari-oblong*, an elongated oblong with the opposite sides nearly parallel.

*Lineari-radiate*, with raylike linear laciniae or lobes.

*Lirellæform*, shaped like a lirella.

*Lirelline*, oblong apothecia elongated into a furrow-like form, simple or branched, sessile or immersed in the thallus, termed a *lirella*, from its shape.

*Livid*, pale and clouded.

*Livido-carneo-fuscescent*, clouded flesh-colored growing brown.

*Livido-castaneous*, of a livid chestnut hue.

*Livido-cinerascent*, of a pale ashey-grey.

*Livido-fuscescent*, clouded brownish.

*Livido-fuscous*, of a pale or livid-brown.

*Livido-glaucouscent*, of a coloured glaucous hue.

*Livido-nigricant*, clouded blackish.

*Livido-pruinose*, clouded with pruina.

*Livido-rufous*, clouded-red.

*Livido-testaceous*, clouded brownish-yellow.

*Livido-virescent*, clouded-green.

*Lobate*, consisting of many lobes or divisions, in contradistinction to *simple*.

*Lobato-crenate*, having crenate lobes.

*Lobato-deformed*, having deformed lobes.

*Lobato-dilated*, with broad expanded lobes.

*Lobato-divided*, divided into lobes.

*Lobato-incised*, deeply cut into lobes.

*Lobato-laciniate*, lobed in a laciniate manner.

*Lobato-partite*, parted into lobes.

*Lobe*, a division of the thallus, various in size and shape.

*Lobed*, consisting of many lobes or divisions.

*Lobulæ*, very minute lobes.

*Lobulato-granulose*, minute granular lobes.

*Longitudinal*, parallel to the longer axis of a figure.

*Lurid*, dull.

*Lurido-cinerascent*, dull ashey-grey.

*Lurido-olivaceous*, a dull olive-hue.

*Lurido-rufescent*, dull reddish.

*Luteo-fulvous*, yellow tawny.

*Luteo-fuscescent*, of a yellow-brownish colour.

*Luteo-ochraceous*, yellow ochrey colour.

- Luteo-rufescent*, yellow-reddish.  
*Luteo-virescent*, yellow-greenish.  
*Lutescenti-fuscescent*, yellowish-brown.  
*Lutescenti-ochraceous*, of a yellowish-ochrey colour.  
*Lycoperdoid*, like a tubercular fungus called Lycoperdon.  
*Macrophylline*, consisting of elongated extended leaflets.  
*Macular*, spotlike or patchy.  
*Maculari-determinate*, a limited or defined spot or patch.  
*Magnoid*, like an alga, consisting of spherical green cellules.  
*Marginal*, situate on a margin or edge.  
*Marginate*, having a margin.  
*Margined*, an apothecium surrounded with a distinct border or elevated margin.  
*Mastoid*, teatlike.  
*Mastoideo-prominent*, in teat-like prominences.  
*Medio-depressed*, depressed or sunken in the centre.  
*Medio-perforate*, perforated in the centre.  
*Medullary axis*, the same as medullary layer, the innermost stratum of the thallus.  
*Membranaceous*, thin, and spread out like a membrane in contradistinction to crustaceous.  
*Membranaceo-corticate*, having a cortical layer thin like a membrane.  
*Membranaceo-dilatate*, a membranaceous thallus, horizontally dilated or spread out.  
*Membranaceo-laciniose*, a membrane cut into laciniae.  
*Membranaceo-lobate*, lobes of a thin membrane-like texture.  
*Membranaceo-papyraceous*, of a membrane-like consistence like paper.  
*Microleptideo-granulose*, composed of minute sealy granules.  
*Microphylline*, composed of minute leaflets or scales.  
*Miniato-fulvescent*, vermilion colour growing tawny.  
*Moderate*, of a size intermediate between large and small.  
*Moniliform*, spherical granules arranged together in a necklace like form.  
*Monophyllous*, of one leaf or membrane.  
*Monophyllo-lobate*, a lobed one-leafed thallus.  
*Mucoso-gelatinous*, of a gelatinous mucous consistence.  
*Mucronate*, with a mucro or point.  
*Multifid*, cut into many laciniae.  
*Multifido-laciniate*, cut into many laciniae.  
*Multi-laciniate*, divided into many laciniae.  
*Multilocular*, many-celled.  
*Multi-nucleolate*, having many nuclei.  
*Multiseptate*, as applied to spores having numerous septa or divisions.  
*Murali-divided*, spores whose internal contents are arranged or divided like the masonry of a stone wall.  
*Murali-locular*, see *murali-divided*.  
*Murali-reticulate*, marked with muriform reticulations.  
*Muriformi-locular*, same as *murali-locular*.

*Naked*, without covering or mark.

*Nerveless*, destitute of nerves.

*Nigrescent*, approaching a black colour.

*Nigrescenti-olivaceo-virescent*, blackish olive-green.

*Nigricant*, black.

*Nigricanti-cærulescent*, of a blackish-blue colour.

*Nigricanti-cinereous*, blackish ashey-grey.

*Nigricanti-clavate*, black club-shaped.

*Nigricanti-fibrillose*, with blackish fibres.

*Nigricanti-furfuraceous*, covered with a blackish scurf.

*Nigricanti-limitate*, thallus defined or limited by a blackish line of hypothallus.

*Nigricanti-macular*, forming a black spot or patch.

*Nigro-cæsius*, blackish blue-grey.

*Nigro-ciliate*, with black ciliæ or hairs.

*Nigro-determinate*, defined by a black line of hypothallus.

*Nigro-fibrillose*, with black fibres.

*Nigro-fibrilloso-ciliate*, ciliated with black fibres.

*Nigro-fusceseent*, black-brown.

*Nigro-fuscous*, of a dark or blackish-brown colour.

*Nigro-marginate*, having black margins.

*Nigro-olivaceous*, black-olive.

*Nigro-piceous*, pitch black.

*Nigro-rhizinose*, having black rhizinæ.

*Nigro-rufous*, black red.

*Nigro-tomentose*, having black tomentum.

*Nigro-virescent*, black or dark green.

*Nodules*, knotlike bodies.

*Noduliform*, like a knot.

*Noduloso-confluent*, knotlike tubercles flowing together or conjoined.

*Noduloso-pulvinate*, in knotlike cushiony patches.

*Normal*, of the ordinary structure or form or size.

*Nucleus*, an internal knot-like substance or contents.

*Nucleiform*, a knot-like tubercle containing a nucleus.

*Nucleolate*, having nuclei.

*Obconico-turbinate*, inversely conical and topshaped.

*Oblique*, slanting.

*Obliterated*, evanescent.

*Obliterato-squamulose*, having scales somewhat obliterated or changed.

*Oblong*, elliptical, obtuse at each end.

*Oblongo-cylindrical*, a wide cylindrical form.

*Oblongo-ellipsoid*, broadly and obtusely elliptical.

*Oblongo-fusiform*, broadly fusiform.

*Oblongo-lobate*, in oblong lobes.

*Oblongo-ovoid*, shape between oblong and eggshape.

*Obovate*, reversely ovate, the broad end uppermost.

*Obscurate*, darkened.

*Obscured*, darkened.

*Obsolete*, evanescent.

*Obtuse*, not pointed, with a rounded or blunt termination.

*Ocellate*, imbedded in and margined like a little eye.

- Ochraceo-ferruginous*, of an ochrey rust colour.  
*Ochraceo-granuloso-pruinose*, with an ochrey granular pruina.  
*Ochraceo-lutescent*, ochrey-yellow.  
*Ochroleuco-pulverulent*, with white or pale ochrey powder.  
*Ochraceo-suffused*, covered with ochrey pruina.  
*Ochroleucous*, pale ochrey-colour.  
*Oleosio-ocular*, spores with cells like drops of oil.  
*Olivaceo-cervine*, olive-tawny.  
*Olivaceo-cinereous*, of an olive ashey-grey.  
*Olivaceo-fuscescent*, olive-brownish.  
*Olivaceo-fuscous*, dark olive-brown.  
*Olivaceo-virescent*, olive-green.  
*Opake*, dull not polished or shining.  
*Orbicular*, of an expanded circular form.  
*Orbiculari-radiose*, passing from an orbicular form into a radiate one.  
*Orbiculari-squamose*, squamæ spreading in an orbicular space.  
*Orbiculate*, same as *orbicular*.  
*Ostiolam*, the portion of the perithecium of a *Verrucaria*, or that portion of the thalline verruca in *Pertusaria*, protruded above the surface of the thallus.  
*Oval*, broadly elliptical obtuse at each end.  
*Oviformi-oblong*, an oblong slightly broader at one end and so approaching to the shape of an egg.  
*Ovato-oblong*, oblong broader at one end.  
*Ovato-subpyriform*, an ovate form verging towards a pear-shape.  
*Ovoid*, shaped like an egg.  
*Ovoido-ellipsoid*, an ellipsis somewhat broader at one end.  
*Pallescent*, growing pale.  
*Pallescenti-livid*, pale clouded.  
*Pallido-albicant*, pale or whitish.  
*Pallido-canescant*, pale hoary.  
*Pallido-castaneous*, pale chestnut-brown.  
*Pallido-cervine*, pale tawny.  
*Pallido-cinerascent*, pale ashey-grey.  
*Pallido-cinereous*, pale ashey grey.  
*Pallido-cinereo-rufescent*, pale ashey-reddish.  
*Pallido-fuscescent*, pale brown.  
*Pallido-fusco-cinerascent*, pale brown ashey-grey.  
*Pallido-glaucescant*, pale glaucous.  
*Pallido-livid*, pale clouded.  
*Pallido-lutescent*, palish-yellow.  
*Pallido-ochraceous*, pale-ochrey.  
*Pallido-rufescent*, pale-red.  
*Pallido-rufous*, pale-red.  
*Pallido-spadicaceous*, pale light-brown.  
*Pallido-sulphureous*, pale sulphur-colored.  
*Pallido-sulphureo-virescent*, pale sulphury-green.  
*Pallido-testaceous*, pale brownish-yellow.  
*Pallido-virescent*, pale-greenish.  
*Palmatifid*, cut or divided in a palmate manner.  
*Palmato-multifid*, cut into many lacinae resembling the human hand.



- Papillæ*, small nipple-like projections.  
*Papillæform*, like small nipple-like prominences.  
*Papillato-dactyloid*, in finger-shaped papillæ.  
*Papillato-exasperate*, roughened with minute papillæ or points.  
*Papillato-sorediate*, with sorediate papillæ.  
*Papillato-unequal*, uneven with papillæ.  
*Papillato-verrucose*, consisting of papillate warts.  
*Papilloso-granulate*, having granular papillæ.  
*Papilloso-scabrous*, roughened with minute nipple-like prominences.  
*Papilloso-subglobose*, of a somewhat globular papillate aspect.  
*Parallel*, lines maintaining an equal distance from each other.  
*Paraphyses*, minute hyaline thread-like filaments accompanying the asci, having rounded or clavate colored apices which by their juxta-position give the peculiar colour to the epithecium.  
*Parasitic*, growing on some other lichen.  
*Paries*, wall.  
*Patellaroid*, like a little dish.  
*Patelliform*, dish-shaped.  
*Patellulate*, like a little dish.  
*Pauci-articulate*, with few joints.  
*Plano-convex*, of flattened convexity.  
*Pedato-radiate*, radiate like the foot of a bird.  
*Pedicillate*, stalked.  
*Pellucid*, transparent.  
*Peltate*, placed like a pelta or shield horizontally on the apex of a division of the thallus or on a stipes.  
*Peltiform*, shield-like.  
*Pendulous*, hanging downwards.  
*Perforated*, having round holes.  
*Peridium*, a membrane covering several hymenia.  
*Perithecium*, the outer case, either entire or dimidiate, enclosing the hymenium as in *Verrucaria*.  
*Persistent*, permanent or not falling off.  
*Piloso-ciliate*, fringed or ciliated with hairs.  
*Pinnatifido-dissected*, cut in a pinnatifid mode.  
*Pinnatifido-divaricate*, divided into lateral segments which spread out in a divaricate manner.  
*Plane*, flattened.  
*Plano-appressed*, flattened and closely pressed to a thing.  
*Plano-canaliculate*, a plane surface channelled.  
*Plano-compressed*, laterally pressed into a flat surface.  
*Plano-depressed*, pressed downwards and flat on the upper surface.  
*Platyphyllous*, broad-leaved.  
*Plicate*, plaited.  
*Plicato-deformed*, deformed by being plaited.  
*Plicato-laciniate*, laciniæ arranged in a plaited manner.  
*Plicato-rugose*, wrinkled in a plaited manner.  
*Plicato-undulate*, plaited and wavy.  
*Plicato-verrucoso-granulose*, having plaited warty granules.  
*Plicatulate*, minutely plaited.

- Pliciform*, plait-like.  
*Plumbeo-albicant*, lead colour becoming whitish.  
*Plumbeo-cærulescent*, leaden-blue.  
*Plumbeo-cinerascent*, leaden ashey-grey.  
*Plumbeo-fuscescent*, of a brownish lead-colour.  
*Plumbeo-glaucrescent*, of a glaucous lead-colour.  
*Plumbeo-virescent*, of a lead-coloured green.  
*Pluri-articulate*, with many articulations or joints.  
*Plurilocular*, many-celled.  
*Pluriseptate*, having many septa.  
*Podetiiform*, resembling a podetium.  
*Podetiiformi-stipitate*, having a stipes like a podetium.  
*Podetium*, the stem-like portion of the thallus in the genus *Cladonia*, which bears on its apex the apothecium.  
*Podicellate*, stalked.  
*Polari-bilocular*, a spore with the cells placed at the opposite apices.  
*Polari-nucleolate*, having nuclei in the opposite apices of a spore.  
*Polygonal*, of many angles.  
*Polymorphous*, of many forms.  
*Polyphyllous*, many-leaved.  
*Polysporous*, having asci containing numerous spores or more than the usual number of 8.  
*Poriform*, like a pore.  
*Predominant*, very conspicuous and in excess.  
*Proliferous*, bearing marginal buds or lobes.  
*Proliferously denticulate*, the marginal teeth becoming proliferous.  
*Prominent*, projecting or elevated.  
*Proper margin*, the margin of the apothecium formed from the apothecium itself and not from the thallus.  
*Prostrate*, lying flat on a surface.  
*Protoplasm*, elementary matter.  
*Protruded*, thrust out or forwards.  
*Psculo-biatorine*, falsely biatorine, or having an apothecium without a conspicuous thalline margin, but at the same time without any observable proper margin or convex and immarginate.  
*Psculo-cyphellæ*, minute excavations on the under surface of the thallus filled with white or yellow powder.  
*Pseudo-cyphellate*, having false or imperfect cyphellæ.  
*Pseudo-disciform*, falsely disk-like.  
*Pseudo-scutelliform*, falsely shield-like.  
*Pseudo-thallodal*, apparently formed of the thallus.  
*Puberulo-villose*, with pubescent hairs.  
*Pulpy*, formed of pulp, springy and elastic.  
*Pulveraceous*, powdery.  
*Pulvereous*, powdery.  
*Pulvereo-granulose*, with powdery granules.  
*Pulverulent*, powdery.  
*Pulverulento-furfuraceous*, powdery and scurfy.  
*Pulverulento-granuloso-furfuraceous*, powdery, granulose, & chaffy or scurfy.  
*Pulvinate*, cushion like.

*Pulvinuli*, cushion-like masses or concretions.

*Pulvinulo-conglomerate*, in cushion-like clusters.

*Punctato-scabrid*, rough with minute elevated points.

*Punctellato-impressed*, with minute sunken or impressed points or dots.

*Punctiform*, like dots or points.

*Punctiformi-contracted*, contracted into a mere point or dot.

*Punctiformi-impressed*, impressed like minute points or dots.

*Pyrenocarpous*, having fructification like that of a *Verrucaria*.

*Pyrenodeous*, wart-like.

*Pyrenodine*, globular and nuclear.

*Pyriform*, pear-shaped.

*Radiate*, spreading outwards on all sides from a centre.

*Radiato-congregate*, in radiate clusters.

*Radiato-coronate*, with a ray-like corona or margin of minute lobes.

*Radiato-crenulate*, with radiating crenulations.

*Radiato-eristate*, with crest-like projections spreading in a radiate way.

*Radiato-cymose*, a cyme spreading ray-like.

*Radiato-fimbriate*, radiately fringed.

*Radiato-fissured*, fissured in a radiate manner.

*Radiato-incised*, deeply cut and radiate.

*Radiato-lobate*, lobed, the lobes spreading in a ray-like way.

*Radiato-plicato-lobate*, lobes spreading in a plaited ray-like fashion.

*Radiato-plicato-rugose*, radiate, plaited and wrinkled.

*Radiato-rimose*, having chinks spreading outwards in a radiate manner.

*Radiato-rugose*, wrinkled in a radiate direction.

*Radiato-rugoso-plicatulate*, wrinkled and plaited in a radiated direction.

*Radiato-sulcate*, furrowed in rays.

*Radioso-fimbriate*, having a radiate fringe.

*Radioso-laciniate*, the separate laciniae of a thallus spreading in a ray-like mode.

*Radioso-rimose*, with ray-like chinks.

*Ramose*, branched.

*Ramoso-divided*, branched in many divisions.

*Ramoso-fimbriate*, branched in a fringed manner.

*Ramoso-incised*, branched and incised.

*Ramuli*, branchlets or secondary branches.

*Ramulose*, with secondary branches.

*Ramuloso-ciliate*, fringed with branching ciliae.

*Ramuloso-spinulose*, having minute spine-like branchlets.

*Receptacles*, the portions of the thallus in which the apothecia are embedded or enclosed.

*Recurved*, curved backwards.

*Reniform*, kidney-shaped.

*Repando-crenate*, sinuously crenate.

*Repando-lobulate*, with repand or sinuous lobes.

*Reticulate*, like network.

*Reticulato-foveolate*, having deep depressions separated by raised reticulations or net-work.

*Reticulato-lacunose*, depressions separated by net-work or elevated reticulations.

*Reticulato-nigricanti-nervose*, reticulated with blackish nerves.

*Reticulato-rimulose*, having very minute rimæ or chinks arranged in a reticulate manner.

*Reticulato-rugose*, wrinkled in a net-like manner.

*Reticulato-rugulose*, minutely wrinkled with elevated reticulations.

*Reticulato-sorediate*, having sorediate elevated reticulations.

*Reticulato-tomentose*, having downy reticulations.

*Retuse*, having the centre depressed.

*Retuso-truncate*, cut off abruptly and having the centre depressed.

*Rhagadioso-diffract*, broken up in a deeply cleft mode.

*Rhizinæ*, root-like filaments.

*Rhizinose*, having rhizinæ or root-like filaments on the under surface of the thallus.

*Rigescens*, approaching a rigid or stiff consistence.

*Rigid*, stiff.

*Rimiform*, having a longitudinal chink or furrow.

*Rimiformi-angustate*, having a narrow chink or furrow.

*Rimiformi-constricted*, having a contracted chink or furrow.

*Rimoso-areolate*, divided into areolæ by chinks.

*Rimoso-diffract*, broken into areolæ by widish chinks.

*Rimoso-insculpted*, having rimæ or chinks sculptured out or cut out of a surface.

*Rimoso-squamulose*, with squamules separated by chinks.

*Rimulose*, broken by minute rimæ or chinks.

*Rimuloso-dehiscens*, ruptured in an irregular radiate chinky manner.

*Rotundate*, rounded.

*Rotundato-deformed*, of a deformed round shape.

*Rotundato-lobate*, with round lobes.

*Rotundato-pulvinular*, in round cushionlike masses.

*Rotundato-undulato-crenate*, rounded, wavy and crenate.

*Rotundo-abbreviato-laciniate*, cut into short rounded laciniae.

*Rotundo-crenate*, rounded and crenate.

*Rotundo-dilated*, rounded and spread out.

*Rotundo-obovate*, of a roundish obovate form.

*Rotundo-poriform*, with a round pore.

*Rotundo-squamulose*, with minute rounded squamules.

*Roseo-carnaceous*, of a rosy flesh-color.

*Rosulate*, rose-like.

*Rosulato-lobulata*, minutely lobed and spreading in a rose-like or stellate manner.

*Rubefr. os*, of a reddish hue.

*Rubricoso-fuscescent*, of a brick-red dark brown.

*Rubricoso-fuscus*, reddish dark brown.

*Rubricoso-nigrescent*, of a brick-red black color.

*Rubricoso-rufescent*, of a brick-red reddish-brown.

*Rufo-badious*, reddish dull brown.

*Rufo-fuscescent*, reddish-brown.

*Rufo-testaceous*, red yellow-brown.



- Rufous*, full red-brown.  
*Rufescent*, reddish-brown.  
*Rufescenti-cinerascent*, reddish ashey-grey.  
*Rugose*, wrinkled.  
*Rugoso-convex*, wrinkled and convex.  
*Rugoso-crenate*, wrinkled into crenations.  
*Rugoso-crenulate*, with wrinkled minute crenations.  
*Rugoso-granulate*, wrinkled and granular.  
*Rugoso-nodulose*, wrinkled and knotty.  
*Rugoso-plicate*, wrinkled and plaited.  
*Rugoso-pustulate*, wrinkled and pustuled.  
*Rugoso-subrimose*, wrinkled and somewhat chinky.  
*Rugoso-unequal*, with an uneven wrinkled surface.  
*Rugulose*, slightly wrinkled.  
*Ruguloso-areolate*, with wrinkled areolæ.  
*Sanguineo-black*, blood-red black.  
*Scabrid*, scabrous or rough.  
*Scabrous*, rough with minute elevations.  
*Scattered*, dispersed.  
*Scobiformi-granulate*, granules like fine saw-dust.  
*Scrobiculate*, having numerous small shallow depressions or excavations.  
*Scurfy*, peeling off in small detached flakes.  
*Scutelliform*, shield-like.  
*Scyphi*, open cups.  
*Scyphiform*, cuplike.  
*Scyphiphorous*, bearing scyphi.  
*Scyphose*, bearing thalline cups as in *Cladonia*.  
*Segregate*, separate.  
*Semi-immersed*, partially immersed.  
*Septate*, having divisions.  
*Septato-articulate*, jointed and septate.  
*Septato-murali-divided*, septate and with muriform cellules.  
*Septulæ*, minute septa.  
*Septum*, the partition dividing the spores internally into two or more portions.  
*Sessile*, without any stipes or stalk.  
*Setuliform*, thread-like.  
*Simple*, as applied to spores having no septum or division.  
*Sinuate*, margin uneven with alternate concavities and convexities.  
*Sinuato-incised*, deeply cut into in a sinuate or wavy manner.  
*Sinuato-flexuose*, sinuate and wavy.  
*Sinuato-laciniate*, cut into sinuate laciniaë.  
*Sinuato-lobate*, lobed in a sinuate manner.  
*Sinuato-multifid*, divided into many sinuate laciniaë.  
*Sinuato-pinnatifid*, deeply cut into lateral segments which have sinuate margins.  
*Sinus*, the concavity in a sinuate lobe or lacinia.  
*Solcaiform*, slipper-shaped.  
*Soredia*, heaps of powdery granules.  
*Sorediato-lacerate*, torn and sorediate.

- Sorediato-tuberculose*, having tubercles more or less sorediate.  
*Sorediiferous*, bearing soredia.  
*Spadiceous*, bright clear brown.  
*Spadiceo-fuscous*, bright dark-brown.  
*Spadiceo-pallescent*, a bright brown growing paler.  
*Spadiceo-rufescent*, reddish-brown.  
*Spadiceo-rufous*, bright brownish red.  
*Sphærical*, globose.  
*Sphæroideo-cellulose*, formed of globular cellulæ.  
*Spermatia*, minute cylindrical or rod-shaped bodies contained in the spermatogonia and conjectured to be the male fertilizing organs.  
*Spermatogonia*, minute tubercles of the thallus various in colour, and conjectured to contain the male organs of fertilization.  
*Spermatogoniferous*, bearing spermatogonia.  
*Spinose*, spiny.  
*Spinulose*, having minute spines.  
*Spinuloso-ciliated*, fringed with minute spine-like cilia.  
*Spongioso-tomentose*, spongy and downy.  
*Spores*, bodies various in shape and size, either simple or septate or locular contained in the asci.  
*Spreading*, expanding.  
*Spurious*, apparently but not really.  
*Squamæform*, scale-like.  
*Squamigerous*, bearing squamæ or scales.  
*Squamose*, consisting of scale-like leaflets or squamæ.  
*Squamoso-decorticate*, the cortical layer peeling off in scales.  
*Squamoso-foliolose*, leaf-like squamæ.  
*Squamoso-lobate*, with lobe-like squamæ.  
*Squama*, a leaf-like scale.  
*Squamaceous*, scaly.  
*Squamulæ*, very minute scales or squamæ.  
*Squamulose*, consisting of very minute leaflike scales or squamæ.  
*Squamuloso-areolate*, with areolate minute scales.  
*Squamuloso-crenate*, having minute crenate scales.  
*Squamuloso-effigurate*, fashioned into scales.  
*Squamuloso-globulose*, consisting of small scaly crumb-like masses.  
*Squamuloso-granulate*, consisting of granular squamules.  
*Squamoso-imbricate*, with overlapping squamæ.  
*Stellato-appressed*, closely pressed in a stellate manner.  
*Stellato-congregate*, clustered in a stellate arrangement.  
*Stellato-dehiscent*, dehiscing in a stellate manner.  
*Stellato-divided*, divided in a stellate or star-like form.  
*Stellato-laciniate*, laciniae spreading in a stellate manner.  
*Stellato-orbicular*, as applied to a thallus whose laciniae or lobes radiate from a centre in a star-like manner within a rounded space.  
*Stellato-radiate*, radiating in a starlike form.  
*Stenophyllous*, narrow-leaved.  
*Sterigmata*, minute filaments either simple or articulate, within the spermatogonia, which bear the spermatia.

*Stipate*, crowded.

*Stipes*, a stalk or elevated support.

*Stipitate*, having a stipes or stalk.

*Stramineous*, straw-coloured.

*Stratum gonidiæ*, the layer immediately beneath the cortical layer containing the gonidia.

*Striated*, marked by longitudinal lines or furrows.

*Striato crenulat*, striated and crenulate.

*Striato-nervous*, striated with prominent nerves.

*Striato-rugose*, wrinkled with striæ.

*Stupens*, woolly.

*Subæruginose*, somewhat of a verdigris-green.

*Subampullæform*, somewhat flask-like shape.

*Subangulose*, somewhat angular.

*Subareolate*, nearly areolate.

*Subbiatorine*, nearly biatorine.

*Subbyssoid*, of a somewhat byssoid or fibrous nature.

*Subcarinate*, somewhat keel-shaped.

*Subciliate*, somewhat ciliate.

*Subclavato-fusiform*, of a somewhat club-shaped spindle-shape.

*Subcolliculoso-areolate*, having areolæ of somewhat hilly projections.

*Subcompressa*, slightly compressed.

*Subconcentric*, arranged in a somewhat concentric manner.

*Subconcolorous*, nearly of the same colour.

*Subconglomerate*, somewhat clustered.

*Subconglutinate*, somewhat glued together.

*Subcontinuous*, having a nearly unbroken surface.

*Subcoriaceous*, somewhat leathery.

*Subcortical*, beneath the cortical layer.

*Subcostate*, somewhat ribbed.

*Subcorymbosa*, with the lower branches elevated to nearly the same level as the upper ones like a corymb.

*Subcrenulate*, somewhat crenulate.

*Subcrustaceo-leproso-granulate*, somewhat crustaceous, leprous and granular.

*Subcylindrical*, nearly cylindrical.

*Subcymbiform*, somewhat of a boat shape.

*Subcymoso-proliferous*, proliferous from the centre like a cyme.

*Subdecorticate*, nearly destitute of the cortical layer.

*Subdeterminate*, somewhat limited or defined.

*Subdiffract*, somewhat broken up into areolæ.

*Subdisciform*, somewhat of a disk-like appearance.

*Subeffigurate*, somewhat of a defined form.

*Subfusiform-areolate*, having areolæ scattered or dispersed in an indefinite manner.

*Subfarinaceous*, somewhat chaff-like.

*Subfastigate*, approaching the same level.

*Subfastigato-fruticulos*, like a little shrub whose branches all rise to nearly the same level.

*Subfibrillose*, somewhat minutely fibrous.

- Subfilamentose*, somewhat filamentose.  
*Subimbricate*, somewhat fringed.  
*Subfoliaceous*, becoming leafy.  
*Subfusiform*, nearly fusiform.  
*Subgelatinous*, somewhat gelatinous.  
*Subglobose*, almost globose.  
*Subgloboso-deformed*, globose bodies deformed by close contact or crowding.  
*Subgloboso-incrassate*, thickened into a somewhat globose form.  
*Subgloboso-tuberculiform*, like globular tubercles.  
*Subgranulato-unequal*, approaching an uneven somewhat granulose surface.  
*Subgranulose*, nearly granulose.  
*Subgranuloso-rugose*, somewhat wrinkled with granules.  
*Subgyrose*, somewhat gyrose.  
*Subgyroso-verrucose*, having somewhat whirled verrucæ or warts.  
*Subhymeniale*, under the hymenium.  
*Subimbricate*, nearly overlapping each other.  
*Subimmersed*, somewhat immersed.  
*Subincumbent*, somewhat bending downwards.  
*Subinnato-sessile*, superficial but somewhat immersed in the thallus.  
*Sublacunose*, somewhat lacunose.  
*Sublævigata*, somewhat smoothed.  
*Sublecanorine*, nearly lecanorine.  
*Sublecidine*, apothecia nearly like those of the genus *Lecidea*.  
*Subleprouse*, somewhat scurfy.  
*Sublimitate*, somewhat limited or with a definite boundary.  
*Sublobato-plicate*, somewhat lobed and plaited.  
*Sublobulate*, somewhat lobed.  
*Sublobulato-concrescant*, growing together in minute lobes.  
*Submembranaceous*, almost membranaceous.  
*Submonophyllous*, almost formed of one leaf.  
*Submurali-divided*, nearly murali-divided.  
*Suborbiculari determinate*, having a limited or defined somewhat orbicular form.  
*Suborbiculari-stellate*, radiating in a somewhat orbicular space.  
*Subpalmato-nervose*, having nerves spreading in a palmate manner.  
*Subpeltate*, somewhat peltate.  
*Subplicato-contiguans*, lying close together in somewhat plaited manner.  
*Subpodicellate*, somewhat stalked or stipitate.  
*Subpyrenoid*, nearly like a *Verrucaria*.  
*Subpyrenoido-lecanorine*, an apothecium nearly like the fructification of a *Verrucaria* but surrounded with a thalline margin.  
*Subradiate*, approaching a radiate shape.  
*Subradiato-lobate*, consisting of somewhat ray-like lobes.  
*Subramoso-papillato-granulate*, with branched papillate granules.  
*Subrubricosofuscous*, somewhat brick-red brown.  
*Subrugose*, somewhat wrinkled.  
*Subrugulose*, somewhat minutely wrinkled.  
*Subsecund*, somewhat turned towards one side.



- Subsessile*, nearly or almost sessile.  
*Subspadiceous*, of a somewhat bright brown.  
*Subsphaerical*, nearly sphaerical.  
*Subspongiose*, nearly spongy.  
*Subsquamosa*, somewhat scaly.  
*Subsquamacco-granulose*, granules becoming nearly like squamæ.  
*Subsquamoso-plicato-verruculose*, with plaited warty scales.  
*Subsquamulose*, almost squamulose.  
*Subsquamuloso-concrescens*, growing together in a somewhat scaly manner.  
*Subsquamuloso-granulata*, the granules merging into scales.  
*Substellato-deformed*, deformed in a somewhat stellate manner.  
*Substellato-radiata*, nearly stellato-radiate.  
*Substipitate*, with a slight stipes or stalk.  
*Substramineous*, somewhat straw-colored.  
*Subtartareous*, nearly tartareous.  
*Subtomentose*, somewhat tomentose or downy.  
*Subulate*, awl-shaped.  
*Subulato-spinose*, with awl-shaped spines.  
*Subuliform*, awl-shaped.  
*Suburceolate*, somewhat urceolate.  
*Subventricosus-cornute*, having a swollen horn-shaped form.  
*Subverrucose*, somewhat warty.  
*Subverrucoso-tomentose*, somewhat warty and downy.  
*Subvirescenti-suffused*, covered with a greenish hue or pruina.  
*Sulciform*, furrowed or channelled.  
*Sulphureous*, sulphur or brimstone colored.  
*Sulphureo-pulverulent*, covered with sulphury powder.  
*Sulphureo-sorediate*, with sulphur-colored soredia.  
*Sulphureo-suffused*, covered with sulphury powder or pruina.  
*Sulphureo-virescent*, sulphury-green.  
*Superficial*, lying on the surface.  
*Tartareous*, having a rough crumbling surface.  
*Tartareo-farinose*, with crumbly powder.  
*Terete*, longitudinally rounded.  
*Tereti-compressed*, terete and compressed.  
*Tereti-usculo-compressed*, somewhat terete or compressed.  
*Terminal*, on the apex or summit of a branch or stipes.  
*Terricole*, growing on the earth.  
*Tessellato-areolate*, having areolæ resembling a tessellated pavement.  
*Testaceo-fuscescent*, yellowish-brown passing into dark-brown.  
*Testaceo-rufescent*, yellowish-brown passing into reddish-brown.  
*Testaceo-rufous*, brownish-yellow red.  
*Thalamium*, the same as hymenium.  
*Thalline*, composed of, or of the same substance as the thallus.  
*Thalline margin*, the margin of an apothecium formed of the thallus.  
*Thallodal*, composed of the thallus.  
*Thallus*, the foliaceous or crustaceous portion of a lichen which bears the fructification.

*Thecæ*, see *Asci*.

*Theciferous*, bearing thecæ or asci.

*Thelotremoid*, having tubercular apothecia like those of *Thelotrema*.

*Thelotremoidco-lecideine*, having an open wart-like and disk-like aspect.

*Thyrsoïd*, like a thyrusus, the branches compact, the lower ones shorter than the middle ones.

*Thyrsoïdco-conglomerate*, clustered together in a thyrusus-like manner.

*Tomentose*, covered with tomentum or down-like hairs.

*Tomentoso-filamentose*, tomentum composed of filaments.

*Torto-curved*, curved and twisted.

*Toruloso-intricate*, knotted and entangled.

*Transverse*, at right angles to the longitudinal direction.

*Tremulous*, shaky.

*Tripartite*, divided into three portions.

*Triquetrous*, three edged or sided.

*Triseptate*, having 3-septa or divisions.

*Truncate*, with an abrupt termination as if cut off.

*Truncato-conical*, of a truncate or flattened cone shape.

*Truncato-crenate*, abruptly cut off and crenate.

*Truncato-furcate*, truncate and forked.

*Tuberculate*, consisting of tubercles.

*Tuberculose*, covered with little excrescences or warts.

*Tuberculoso-albo-sorediate*, having white sorediate tubercles.

*Tuberculoso-elevated*, raised upon a tubercle.

*Tuberculoso-glomerate*, in clustered tubercles or conglomerations.

*Tuberculoso-lecanorine*, a lecanorine apothecium elevated on a tubercle.

*Tuberculoso-nigricanti-sorediate*, having blackish sorediate tubercles.

*Tuberculoso-spherical*, consisting of round tubercles.

*Tuberculoso-unequal*, uneven with tubercles.

*Tubulose*, hollow like a tube.

*Tubuloso-inflated*, having an inflated tube-like form.

*Tumid*, swollen.

*Turbinate*, shaped like a top.

*Turbinato-cylindrical*, of an elongated top-like form.

*Turbinato-lentiform*, top-shaped flattened on the summit.

*Turgescent*, swollen.

*Turgid*, swollen.

*Turgido-cylindrical*, of a swollen cylindrical shape.

*Umber*, dull brown.

*Umbilically*, as applied to a thallus fixed to the matrix by the centre; as applied to an epithecium, navel-like.

*Umbonate*, with a projecting point or boss in the centre.

*Umbrino-olivaceous*, umber-colored olive.

*Undulate*, wavy.

*Undulato-attenuate*, tapering upwards in a wavy mode.

*Undulato-crispate*, wavy and crisped or curled.

- Undulato-crisped*, wavy and crisped.  
*Undulato-lobate*, with wavy lobes.  
*Undulato-plane*, a flattened wavy surface.  
*Undulato-plicate*, wavy and plaited.  
*Undulato-rugose*, wrinkled in a wavy mode.  
*Undulato-sinuate*, waved in a sinuate mode.  
*Undulato-sulcato-rugose*, with wavy furrowed wrinkles.  
*Uniform*, of the same size, thickness or substance throughout.  
*Uniseptate*, spores with one septum or division.  
*Unstratified*, applied to a thallus in which the normal layers cannot be distinctly seen but are confused.  
*Urceolate*, of a sunken cup-like shape.  
*Urceolariform*, sunk in the thallus like a cup as the apothecia of the genus *Urceolaria*.  
*Urceolato-appressed*, having an urceolate apothecium closely pressed to the thallus.  
*Urceolato-concave*, concave like a cup.  
*Urceolato-innate*, applied to apothecia of a cuplike shape sunken in the thallus.  
*Urceolato-scutelliform*, urceolate and shield like.  
*Variolarioid*, an abortive apothecium developed into a powdery or granulose tubercle, like the supposed fructification of the old pseudo-genus *Variolaria*.  
*Villose*, hairy.  
*Vinous-red*, red like port wine.  
*Violaceo-fuscescent*, violet with a brown hue.  
*Violaceo-rubescens*, violet with a red tinge.  
*Virescent*, approaching a green hue.  
*Virescenti-cinerascent*, greenish ashey-greyish.  
*Virescenti-cinereous*, greenish ashey-grey.  
*Virescenti-fuscescent*, greenish brown.  
*Virescenti-fuscous*, greenish dark-brown.  
*Virescenti-olivaceous*, greenish olive.  
*Viridi-glaucouscent*, glaucous-green.  
*Viridulo-cinerascent*, greenish-grey.  
*Vitellinous-yellow*, yellow like the yolk of an egg.  
*Vermiculari-elongate*, lengthened out like a worm.  
*Vermiform*, worm like.  
*Vermiformi-cylindrical*, cylindrical and twisted like a worm.  
*Ventricoso-fusiform*, of a swollen or inflated spindle-shape.  
*Verrucaroid*, having fruit like the verrucæ or apothecia of a *Verrucaria*.  
*Verrucæ*, small wart-like tubercles or elevations of the thallus.  
*Verrucæform*, of a wart-like tubercular form.  
*Verrucose*, wart-like.  
*Verrucoso-areolate*, composed of wart-like areolæ.  
*Verrucoso-areolato-diffract*, broken up into verrucose areolæ.  
*Verrucoso-confluent*, with warts growing together.  
*Verrucoso-conglomerate*, in clustered verrucose portions.  
*Verrucoso-diffract*, divided by chinks into wartlike areolæ.  
*Verrucoso-glebulose*, having crumb-like warts.

- Verrucoso-glomerulose*, conglomerated into wart-like heaps.  
*Verrucoso-granulate*, a thallus composed of verrucae and granules.  
*Verrucoso-leprose*, with warty scurf.  
*Verrucoso-papillate*, having papillae-like warts.  
*Verrucoso-rugose*, with wrinkled warts.  
*Verrucoso-scabrous*, roughened with warts.  
*Verrucoso-sorediate*, having wartlike soredia.  
*Verrucoso-squamose*, consisting of scaly warts.  
*Verrucoso-tomentose*, warty and tomentose.  
*Verrucoso-tuberculose*, having wartlike tubercles.  
*Verrucoso-unequal*, unevenly wartlike.  
*Verruculoso-emerulent*, consisting of ashey-grey small warts.  
*Verruculoso-scabrous*, roughened with very minute warts.  
*Verticillato-proliferous*, becoming proliferous, whorl above whorl.  
*Waxy*, of a waxlike consistence or aspect.  
*Zonate*, marked with concentric wavy undulations.





THE  
LICHEN-FLORA  
OF  
GREAT BRITAIN,  
&c.

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CLASS OF LICHENS.

Thallus furnished with a stratum of gonidia or granula gonima variously disposed, very often (at least in the crustaceous species) containing crystals of oxalate of lime. Fructification consisting of spores in thecae or asci; gelatina hymenea in most species becoming blue, in others reddish, on the application of an aqueous solution of iodine. Spermogonia in pyrenodine conceptacles distinct from the apothecia, and occurring either generally on the same thallus with the apothecia, (*monœcious*) or sometimes separately on different thalli (*diœcious*).

Lichens are distinguished from Fungi by the peculiar type, form and structure of the thallus. The families and their principal sub-divisions are chiefly based on the diversities of the thallus, though sometimes the differences of the apothecia and spermogonia determine these.

Thallus gelatinous. Family I. COLLEMACEI.

Thalamium cellulose, with superimposed theciferous cavities. = Family II. MYRIANGIACEI.

Thallus not gelatinous. = Family III. LICHENACEI.

## FAM: I. COLLEMACEI.

Thallus filiform, branched. = Tribe I. LICHINEI.

Thallus membranaceous, lobate. = Tribe II. COLLEMEI.

## FAM: II. MYRIANGIACEI.

Thalamium cellulose, with superimposed theciferous cavities. = Tribe I. MYRIANGIEI.

## FAM: III. LICHENACEI.

Spores pulverulent on surface of fructification. = Series I. EPICONIODEI.

Thallus foliolose; apothecia terminal on podetia, biatorine. = Series II. CLADODEI.

Thallus efoliolose, fruticulose or filamentose; apothecia lecanorine. = Series III. RAMALODEI.

Thallus foliaceous, depressed, lobed. = Series IV. PHYLLODEI.

Thallus crustaceous, squamose, radiate, granulose, powdery, or evanescent. = Series V. PLACODEI.

Fructification in closed receptacles. = Series VI. PYRENOIDEI.

## SERIES I. EPICONIODEI.

Thallus horizontally expanded; apothecia stipitate, cupuliform, or sessile. = Tribe I. CALICIEI.

Thallus fruticulose, ramose; apothecia nucleiform. = Tribe II. SPHÆROPHOREI.

## SERIES II. CLADODEI.

Thallus horizontal; apothecia substipitate. = Tribe III. BÆOMYCEI.

Thallus foliaceous; apothecia biatorine on scyphiform or simple podetia. = Tribe IV. CLADONIEI.

Thallus caespitose, podetiiform; apothecia terminal or lateral, lecideine. = Tribe V. STEREOCAULEI.

## SERIES III. RAMALODEI.

Thallus branched, white; apothecia lateral. = Tribe VI. ROCCELLEI.

Thallus podetiiform; apothecia unknown. = Tribe VII. SIPHULEI.

Thallus branched, terete, or compressed, medullary axis firm; apothecia peltate. = Tribe VIII. USNEI.

Thallus branched, round or compressed, medullary axis woolly; apothecia lateral or terminal. = Tribe IX. RAMALINEL.

Thallus compressed, fruticulose or membranously dilated; apothecia marginal. = Tribe X. CETRARIEL.

## SERIES IV. PHYLLODEI.

Apothecia peltiform. = Tribe XI. PELTIGEREI.

Apothecia marginal, on under side of thallus. = Sub-tribe 1. NEPHROMEI.

Apothecia marginal, on upper side of thallus. = Sub-tribe 2. PELTIDEI.

Apothecia not marginal, innate. = Sub-tribe 3. SOLORINEI.

Apothecia lecanorine. = Tribe XII. PARMELIEI.

Thallus membranaceo-lobate, tomentose and cyphellate beneath; spores fusiform, 1-3-septate; paraphyses distinct. = Sub-tribe 1. STICTEI.

Thallus laciniato-lobate; spores ellipsoid, simple; paraphyses indistinct. = Sub-tribe 2. IMBRI-CARIEI.

Thallus; stellato-orbicular, spores bilocular; paraphyses distinct. = Sub-tribe 2. PHYSCIEI.

Apothecia lecideine, gyrose. = Tribe XIII. GYROPHOREI

## SERIES V. PLACODEI.

Apothecia lecanorine. = Tribe XIV. LECANOREI.

Thallus squamulose, gonidia large, distinct. = Sub-tribe 1. PSOROMEI.

Thallus squamulose or granulose, with granula gonima (no gonidia). = Sub-tribe 2. PANNARIEI.

Thallus pulverulent. = Sub-tribe 3. AMPHILOMEI.



Thallus radiosio-laciniate or cartilagineo-squamose; spores ellipsoid, simple. = Sub-tribe 4. SQUAMARIEI.

Thallus radiate (not radiosio-laciniate); spores ellipsoid, bilocular, cells united by a tube. = Sub-tribe 5. PLACODEI.

Thallus crustaceous, granulose; spores simple or variously septate. = Sub-tribe 6. EULECANOREI.

Apothecia endocarpoid, enclosed in verrucæ of thallus; spores very large, ellipsoid. = Sub-tribe 7. PERTUSARIEI.

Apothecia in thalline verrucæ, but with an open epithecium; spores plurilocular or murali-divided; = Sub-tribe 8. THELOTREMEI.

Apothecia biatorine or lecideine or gyalectine. = Tribe XV. LECIDEINEI.

Apothecia lirelline. = Tribe XVI. GRAPHIDEI.

Hymenia covered by a black rimuloso-dehiscent peridium. = Tribe XVII. PERIDIEI.

## SERIES VI. PYRENODEI.

Apothecia pyrenodine. = Tribe XVIII. PYRENOCARPEI.

## FAM : I. COLLEMACEI.

### TRIBE 1. LICHINEI.

Thallus cæspitose, granula gonima concatenate into a central axis; apothecia biatorine. = GONIONEMA.

Thallus cæspitose, granula gonima in transverse strata; apothecia lecideine. = SPILONEMA.

Thallus fruticulose, granula gonima connate in transverse strata; apothecia endocarpoid in swellings of the thallus. = EPHEBE.

Thallus fruticulose, fucoid, granula gonima cærulescent; apothecia in terminal globose receptacles. = LICHINA.

### TRIBE 2. COLLEMEI.

Thallus granulato-areolate, granula gonima in globular cells; apothecia urceolato-innate; spores simple. = PYRENOPSIS.

Thallus granulose or fruticulose, granula gonima in globular cells ; apothecia innate, lecanorine or endocar-poid ; spores simple. = *SYNALISSA*.

Thallus without cortical layer, granula gonima moniliform ; apothecia lecanorine ; spores multilocular, rarely simple. = *COLLEMA*.

Thallus with distinct cortical layer, granula gonima moniliform ; apothecia lecanorine ; spores multilocular, rarely simple. = *LEPTOGIUM*.

Thallus minute, stellato-divided, or cæspitellose, or confluento-effuse ; apothecia pyrenocarpous, verrucari-oid. = *PYRENIDIUM*.

## FAM : II. MYRIANGIACEI.

### TRIBE I. MYRIANGIEI.

Thalamium cellulose, with superimposed theciferous cavities. = *MYRIANGIUM*.

## FAM : III. LICHENACEI.

### SERIES I. EPICONIODEI.

#### TRIBE I. CALICIEI.

Thallus none ; apothecia parasitic on *Pertusariæ* globoso-turbinate, subsessile, black ; spores nigrescent, simple. = *SPHINCTRINA*.

Thallus granuloso-pulverulent ; apothecia globoso-turbinate, stipitate, black ; spores nigro-fuscous, simple or 1-septate. = *CALICIUM*.

Thallus pulverulent ; apothecia globoso-pulverulent yellow ; spores colourless. = *CONIOCYBE*.

Thallus granulose ; apothecia cupuliform, sessile, black ; spores nigricant, 1-septate. = *TRACHYLIA*.

#### TRIBE II. SPILEROPHOREI.

Apothecia terminal, nucleiform, globose, irregularly dehiscent ; spores spherical, violet-black. = *SPILERO-PHORON*.

## SERIES II. CLADODEI.

## TRIBE III. BÆOMYCEI.

Thallus gelatinoso-conglutinate ; apothecia stipitate clavato-capitate ; spores filiform, multiseptate. = *GOMPHILLUS*.

Thallus crustaceo-granulose or subsquamulose ; apothecia stipitate or sessile, biatorine. = *BÆOMYCES*.

## TRIBE IV. CLADONIEI.

Thallus foliolose, or squamulose, or granuloso-crustaceous ; podetia fistulose, laciniato-ramose or scyphose ; apothecia terminal, biatorine, livido-fuscous, or scarlet. = *CLADONIA*.

Thallus verrucoso-granulate, bearing large fuscous sessile cephalodia ; podetia rigid, simple, minute ; apothecia terminal, subglobose, black. = *PILOPHORON*.

## TRIBE V. STEREOCAULEI.

Podetia covered with variously-shaped fragile granules ; apothecia fuscous ; spores cylindracco-fusiform, 3-9-septate ; cephalodia verrucoso-glomerulose. = *STEREOCAULON*.

## SERIES III. RAMALODEI.

## TRIBE VI. ROCCELLEI.

Thallus fruticulose, from a common base, terete or compressed ; spores oblong or fusiform, 3-septate. = *ROCCELLA*.

## TRIBE VII. SIPHULEI.

Thallus of prostrate subulate stipites, acute at the apices, fistulose. = *THAMNOLIA*.

## TRIBE VIII. USNEEI.

Thallus filamentose, pale cinereo-virescent ; apothecia concolorous. = *USNEA*.

Thallus evernioid, citrino-virescent; apothecia spadiceo-fuscous. = *CHLOREA*.

### TRIBE IX. RAMALINEI.

Thallus cylindrical, horny; spores simple = *ALECTORIA*.

Thallus applanate, flaccid; spores simple. = *EVERNIA*.

Thallus compressed, rigescent; spores 1-septate.

*RAMALINA*.

### TRIBE X. CETRARIEI.

Thallus spadiceous, laciniose or fistulose. = *CETRARIA*.

Thallus various in colour, membranaceo-dilatate and lobate. = *PLATYSMA*.

## SERIES IV. PHYLLODEI.

### TRIBE XI. PELTIGEREI.

#### SUB-TRIBE I. NEPHROMEI.

Cortical layer continuous on the nerveless lower surface of the thallus; spores septate. = *NEPHROMIUM*.

#### SUB-TRIBE II. PELTIDEI.

Cortical layer not continuous on the nerved and rhizinose lower surface of the thallus; spores 3-5-7-septate. = *PELTIGERA*.

#### SUB-TRIBE III. SOLORINEI.

Cortical layer not continuous on the obsoletely-nerved lower surface of the thallus; spores 1-septate. = *SOLORINA*.

### TRIBE XII. PARMELIEI

#### SUB-TRIBE I. STICTEI.

Gonidial stratum of the thallus consisting of glaucovirescent or glauco-cærulescent granula gonima in plural locular nodules. = *STICTINA*.

Gonidial stratum of the thallus consisting of free, true, bright or yellow-green gonidia; rhizinae simple. = *STICTA*.

Under surface of thallus with fasciculate rhizinae; spores 1-3-septate. = *RICASOLIA*.



## SUB-TRIBE II. IMBRICARIEI.

Spores simple. = PARMELIA.

## SUB-TRIBE III. PHYSCIEI.

Spores polari-bilocular or 1-septate. = PHYSCIA.

## TRIBE XIII. GYROPHOREI.

Thallus monophyllous, umbilically affixed. = UMBILICARIA.

## SERIES V. PLACODEI.

## TRIBE XIV. LECANOREI.

## SUB-TRIBE I. PSOROMEI.

Gonidial stratum of thallus consisting of large distinct gonidia. = PSOROMA.

## SUB-TRIBE II. PANNARIEI.

Gonidial stratum of thallus consisting of granula gonima. = PANNARIA.

## SUB-TRIBE III. AMPHILOMEI.

Thallus white, granuloso-pulverulent. = AMPHILOMA.

## SUB-TRIBE IV. SQUAMARIEI.

Spores simple. = SQUAMARIA.

## SUB-TRIBE V. PLACODEI.

Spores polari-bilocular. = PLACODIUM.

## SUB-TRIBE VI. EULECANOREI.

Apothecia internally colourless ; spores 8 or numerous, simple or variously divided, colourless or fuscous. = LECANORA.

Apothecia urceolate ; spores murali-ocular. = URCEOLARIA.

Apothecia tuberculoso-lecanorine ; hypothecium black ; spores fusiform, 3-septate. = **DIRINA**.

#### SUB-TRIBE VII. PERTUSARIEL.

Apothecia endocarpoid, or lecanoroid or variolared ; spores 1-2 4-8, simple, very large, ellipsoid, with a thick episporium. = **PERTUSARIA**.

Apothecia erumpent, rotundato-diliformed ; spores 1-2, murali-divided. = **PHLYCTIS**.

#### SUB-TRIBE VIII. THELOTREMEL.

Apothecia verrucæform, open ; spores 8, murali divided. = **THELOTREMA**.

#### TRIBE XV. LECIDEINEI.

Thallus crustaceous, squamose, scurfy, powdery, granulate, areolate, continuous, rimulose, or evanescent ; spores 8 or numerous, colourless or fuscous, simple or variously septate. = **LECIDEA**.

Thallus evanescent ; apothecia gymnotremoid, naked, black ; spores 3-septate. = **ODONTOTREMA**.

Thallus evanescent ; apothecia lecideine, elevated, naked, black ; spores numerous. = **SCHIZOXYLON**.

Apothecia red, rotundate or oblong, biatorine, plane, internally colourless ; spores 8, simple. = **AGYRIUM**.

#### TRIBE XVI. GRAPHIDEL.

Apothecia black, tumid ; hypothecium black, entire ; spores 8 or numerous, simple or 1-septate. = **LITHOGRAPHIA**.

Apothecia black, linear, parallel, plane, internally cinerascens ; spores 8, simple. = **XYLOGRAPHIA**.

Apothecia black, innate or immersed ; spores 8, oblong or linear elongate or cylindrical, pluri-ocular ; paraphyses distinct. = **GRAPHIS**.

Apothecia black, superficial ; perithecium black, entire ; spores 8, obovate or fusiform, 1 multiseptate ; paraphyses indistinct. = **OPEGRAPHIA**.

Apothecia black, impressed in thalline verrucæ and surrounded with a spurious thalline margin ; hypothe-

cium black ; spores fusiform, 3 septate. = *PLATYGRAPHA*.

Apothecia brownish, punctiform or elongate, immersed ; hypothecium colourless. = *STIGMATIDIUM*.

Apothecia roundish, plane or tumid, innately sessile ; asci pyriform in excavations of the subgelatinous hymenium ; paraphyses none. = *ARTHONIA*.

Apothecia intricato-flexuose, immersed in white plano-depressed verrucæ. = *GLYPHIS*.

Apothecia substellato-radiate, immersed in white rounded verrucæ ; spores fusiform, 3-septate. = *CHIO-DECTON*.

Apothecia black, superficial, arthonoid ; spores 1-septate ; paraphyses distinct. = *MELASPILEA*.

#### TRIBE XVII. PERIDIEI.

Apothecia containing many hymenia conjoined as in a common excipulum, but without perithecia. = *MYCOPORUM*.

Apothecia rotundate, depressed in the centre, dehiscing by a subradiate fissure. = *RIMULARIA*.

#### SERIES VI. PYRENODEI.

#### TRIBE XVIII. PYRENOCARPEI.

Apothecia single in citrine spherical thalline verrucæ ; spores numerous. = *THELOCARPON*.

Perithecia black, immersed in a squamulose thallus ; spores 8, septate. = *NORMANDINA*.

Perithecia pale, immersed in a peltate or squamæform thallus ; spores 8, simple. = *ENDOCARPON*.

Perithecia black, rarely coloured, entire or dimidiate, semi-immersed or sessile ; spores 8 or numerous, simple or variously septate. = *VERRUCARIA*.

Follicolous. = *STRIGULA*.

Perithecia numerous, minute, black, imbedded in a round or oblong blackish plane apothecium. = *MELANOTHECA*.

Perithecia several, stellato-congregate, their ostiola converging into one common central poriform epithecium. = *ASTROTHELIUM*.

## FAM: I. COLLEMACEI.

Thallus black, fuscous, dark olive, rarely cinerascens or glaucescent, variable in form; granula gonima either moniliform or variously dispersed in the gelatinous substance of the thallus. Apothecia generally lecanorine, rarely biatorine, rarely endocarpoid, generally rufescent, rarely black, internally whitish or pale.

## TRIBE I. LICHINEI.

Thallus small or minute, filiform, caespitose-fruticulose, or depresso-implexed; granula gonima moniliform connate or variously concrete. Apothecia lecanorine, biatorine or lecideine or endocarpoid. Spores 8, colourless.

I. GONIONEMA. *Nyl.*

Thallus filiform, granula gonima concatenated into a single central axis. Apothecia concolorous, biatorine. Spermatia minutely oblong, simple.

I. *G. velutinum*, *Nyl.* dark-brown, slender, entangled apothecia dark-brown, terminal, centre depressed, margin swollen, pale within; spores 8, colourless, ellipsoid, simple; paraphyses slender.

On sub-alpine rocks, rare. 1864.

SYN:—*Nyl. Prodr.* 16 (1857); *Syn.* 88; *Scand.* 23; *Collema, Ach. Syn.* 329.

FIG:—*Ann. & Mag. Nat. Hist.* July 1865, t. 4, f. 1, 2, 3, 4, 5, 6; *Nyl. Syn.* t. 1, f. 11.

GEOG. DISTRIB:—Europe, Scandinavia, France.

BOT. PROV:—1. 7.

ENGLAND:—St. Cleere near Liskeard. *Messrs. Turner & Sowerby.*

WALLS:—Bournemouth. *Dr. Holl.* Craig Breidden, ! (northern precipices) Montgomeryshire (1864); Snowdon !.

II. SPILONEMA. *Born.*

Thallus filiform, branched, fruticulose, granula gonima large, in transverse strata. Apothecia lecideine, lenticular. Spermatia shortly cylindrical.

1. *Sp. parvolum*, *Born.* blackish-brown, slender, caespitose, entangled, branched; apothecia black, terminal, hemispherical, immarginate; *hypothecium nigrescent*:



spores 8, colourless, oblong, *simple*; paraphyses thick, articulate.

On maritime rocks, rare. 1856.

SYN :—Bornet in Mém. Cherb. Dec. 1856, p. 4; Nyl. Prodr. 17; Syn. 89; Scand. 23.

FIG :—Mém. Cherb. l. c. t. 1 & 2; Ann. & Mag. Nat. Hist. July 1865, t. 4, f. 7, 8, 9, 10, 11; Nyl. Syn. t. 2, f. 3.

EXS :—Leight. 347.

GEOG. DISTRIB :—France, Pyrenees, Finland.

BOT. PROV :—7...16.

SCOTLAND :—Appin. Rev. J. M. Crombie.

WALES :—Rocks near Harlech Turnpike, Barmouth! (1856); Glyder Vach! Snowdonia; Llyn Cae! Cader Idris.

Attention to the regular transverse arrangement, grouping and size of the granula gonima will distinguish this from *Ephebe pubescens* which it generally resembles.

2. *Sp. Scoticum*, Nyl. black or fuscous, *effuse*, *minutely coralloid*, in small compact verrucose pulvinuli; apothecia black, minute; epithecium impressed or somewhat convex; *hypothecium colorless*; spores 8, colourless, oviformi-oblong, 1-septate; paraphyses slender, distinct; gelatina hymenea tinged blue, the asci violet, by iodine.

On alpine micaceo-schistose rocks, rare. 1869.

SYN :—Nyl. in Flora 1869, p. 82; Crombie En. 1.

BOT. PROV :—15.

SCOTLAND :—Ben Lawers. Rev. J. M. Crombie. (1869)

### III. EPHEBE. *Fr. Born.*

Thallus filiform, branched, fruticulose; granula gonima smaller, subtransversely arranged in little heaps, 2, 4, or more together. Apothecia endocarpoid, in thickened portions of the thallus. Spermatia straight, cylindrical.

1. *E. pubescens*, Fr. blackish-brown, slender, caespitose, entangled, branched, slightly rugulose; spores 8, colourless, linear-oblong or subfusiform, 1-septate; paraphyses indistinct.

On subalpine rocks, not unfrequent. 1851.

SYN :—Fries S.O.V. 256 (1825); Bornet in Ann. Sc. Nat. ser. 3, xviii, 170. Nyl. Prodr. 17, Syn. 90, Scand. 24.

FIG :—Ann. Sc. Nat. l. c. t. 7. Ann. & Mag. Nat. Hist. July, 1865, t. 4, f. 12, 13, 14. Nyl. Syn. t. 2, f. 1, & 17—20.

EXS :—Nyl. 1. M. & N. 358. Hepp. 712. Fellm. 2.

GEOG. DISTRIB :—Scandinavia, E. Lapland, France, Switzerland, Algeria, Greenland, N. America.

BOT. PROV :—1...7...11...15, 16...19...23.

ENGLAND :—Dartmoor ! *Mr. Ralfs*. South Devon. *Rev. J. M. Crombie*. Eglestone, Durham. *Rev. J. Harriman*. In the river Erme above Ivy Bridge, Devon. *Dr. Holl*. Blackstone Rock, Dartmoor. *Mr. Parfitt*.

SCOTLAND :—Loch Awe ; Achallater, Braemar ; Craig Guie ! *Rev. J. M. Crombie*.

IRELAND :—Glengarriff, Coachford ! west of Cork. *Mr. Carroll*. Dublin Mountains. *Mr. Archer*. Loch Leane and Cromaglan, Killarney. *Dr. Carrington*.

WALES :—Summit of Pen-maen-mawr ! ; (1851) Barmouth ! ; Glyder Vach !, Snowdonia.

#### IV. LICHINA. Ag.

Thallus fuscous-black, fruticulose, firm, granula gonima cærulescent. Apothecia terminal in globose thalline receptacles, lecanorine, subpyrenoid. Spores 8, colourless, ellipsoid, simple. Spermatia oblong.

1. *L. pygmaea*, Ag. caespitose, ramose, small, *compressed upwards*.

On maritime rocks, not unfrequent. 1777.

SYN :—Agardh. Syn. 9. (1817) ; Nyl. Syn. 91, Scand. 24.

FIG :—E. Bot. t. 1332. Grev. Scott. Crypt. t. 219. Tulasne Mem. Lich. t. 9, f. 1-6. Ann. and Mag. Nat. Hist. July, 1865, t. 4, f. 21. Nyl. Syn. t. 2, f. 16.

EXS :—Leight. 260. Hepp 423. Larbal. 51.

GEOG. DISTRIB :—Europe, Scandinavia, Chili.

BOT. PROV :—1...10, 11...14...18...23...30, 31.

ENGLAND :—Cornish Coast ; Devonshire ; Dorsetshire ; *Sir J. E. Smith*. Mounts Bay ! Cornwall. *Mr. Ralfs*. Torquay ! Devon. *Dr. Deakin*. Cullercoats Pier, Northumberland. *Mr. Baker*. Huntcliff, Cleveland. *Mr. Muhl*. Rocks near Shaldon, Babbicombe, Torquay. *Mr. Parfitt*.

SCOTLAND :—Leith and Newhaven ; Hebrides. *Sir J. E. Smith*. Isles of Jura, Iona, Frith of Forth. *Rev. J. Lightfoot*. (1777).

IRELAND :—Maritime rocks. *Mr. Carroll*. Ardglass co. Down. *Dr. Maingay*. Dublin. *Dr. Moore*.

CHANNEL ISLANDS :—Coast of Jersey ; Shores of Serk, Herm, and Jethou ! *Mr. Larbalestier*.

2. *L. confinis*, Ag. densely caespitose, very small, *round, not compressed*.

On maritime rocks, not unfrequent. 1813.

SYN :—Agardh. Spec. 105. (1832) ; Nyl. Syn. 92. Scand. 24.

FIG :—E. Bot. t. 2575. Grev. Scott. Crypt. t. 221. Tul. Mem. Lich. t. 10, f. 12, 18. Ann. and Mag. Nat. Hist. July, 1865, t. 4, f. 22.

EXS :—Larbal. 1. Rabh. 782.

GEOG. DISTRIB :—Europe, Scandinavia, France, Spain, Portugal, Faroe Islands.

BOT. PROV :—1...6, 7...15...19...23...30, 31.

ENGLAND :—Mounts Bay! Cornwall. *Mr. Ralfs*. Whitesand Bay, Cornwall. *Dr Holl*.

SCOTLAND :—Kincardine. *Rev. J. M. Crombie*.

IRELAND :—Kenmare river. *Sir T. Gage*. (1813). Co. Down. *Dr. Maingay*. near Cork. *Mr. Carroll*. Dublin. *Dr. Moore*.

WALES :—Brocastle, Glamorgan. *Dr Holl*. Black Stones, Con-way Bay!

CHANNEL ISLANDS :—South Coast of Jersey! *Mr Larbalestier*.

## TRIBE 2. COLLEMEI.

Thallus very various, crustaceous, granulose or lobate, laciniate or microphylline; granula gonima glaucous-green either moniliform or variously dispersed. Apothecia lecanorine or biatorine or endocarpoid.

### I. PYRENOPSIS. *Nyl*.

Thallus crustaceous, thin, granuloso-areolate, laxly cellulose, granula gonima agglomerated in the cells. Apothecia concolorous, minute, urceolato-innate in a prominent margined receptacle, margin somewhat swollen and connivent. Spores simple.

1. *P. haematopis*, (*Smrft*) *dark or rubricoso-fuscous*, crustose, opaque, *verrucoso-unequal*, thickish, *diffract*, internally subconcolorous or more nigricant in the lower portion; spermatia very minute, ellipsoid; *apothecia superficial, urceolate, margins elevated, entire*; spores 8, colourless, ellipsoid, simple.

On alpine rocks, rare. 1865.

SYN :—*Smrft*. Lapp. 117. (1829). *Nyl*. Lapp. or. 104. *Crombie* En. 2.

EXS :—*Fellm*. 5.

GEOG. DISTRIB :—Lapland.

BOT. PROV :—15.

SCOTLAND :—Ben Lawers. *Adm. Jones*. (1865).

2. *P. granatina*, (*Smrft*.) *fusco-rufescent, tartareous, effuse, rimoso diffract, granulose, granules rugoso-nodulose*, somewhat plane, opaque, often contiguous, rotundato-diffracted; *apothecia minute, numerous in each thalline granule*, internally whitish, reddish, shining, *margin thin, entire, whitish*; spores 8, colourless, ellipsoid, sim-

ple, or spuriously 1-septate; gelatina hymenea and thecæ blue with iodine.

On mountain rocks, very rare. 1865.

SYN :—Smitt. Lapp. 90. (1826). Nyl. Lapp. or. 104. Crombie En. 2.

EXS :—Fellm. 4.

GEOG. DISTRIB :—Russia, Lapland.

BOT. PROV :—7, 15.

SCOTLAND :—Ben Cruachan in Breadalbane. *Rev. J. M. Crombie*. (1865). Ben Lawers. *Dr. Holl*.

WALES :—Cader Idris. *Dr. Holl*.

3. *P. homœopsis*, Nyl. brown, thin, effuse, *sub granulose*; apothecia concolorous, *lecanorine*, small, internally pale; epithecium colourless; paraphyses slender; spores 8, colourless, ellipsoid, simple; gelatina hymenea vinous-red with iodine.

On micaceous boulders, rare. 1867.

Allied to *P. grumulifera*, Nyl. but distinct.

SYN :—Nyl. in Flora, 1868. p. 342. Crombie in Seeman Journ. Bot. 7. 48. (1869).

BOT. PROV :—15.

SCOTLAND :—Loch-na-cat, Ben Lawers. (1867) *Rev. J. M. Crombie*.

4. *P. Schærerii*, (Mass.) *fusco-cinerascent* or *cinereo-nigrescent*, subtartareous, effuse, thinly *scobiformi-granulate*, *subareolate*, *subspongiose*; apothecia *atrorufous* or dark blue, very minute, crowded, *globoso-truncate*, *punctiformi-impressed*, then *disciformi-dilated*, margined; spores 8, colourless, *globoso-ovoid*, simple.

On calcareous rocks, rare.

SYN :—Nyl. Stizb. Flecht. 141. Crombie En. 2.

SCOTLAND :—Craig Guie, Braemar. *Rev. J. M. Crombie*.

5. *P. lecanopsoides*, Nyl. *fuscous-black*, opaque, thin, *granuloso-areolate* or nearly continuous, somewhat *sca-brous*; apothecia concolorous, *urceolate*, thalline margin prominent, *connivent*; spores 4-8, colourless, ellipsoid, simple; paraphyses slender, not crowded.

On maritime calcareous rocks, rare. 1866.

SYN :—Nyl. in Flora, 1866, p. 374. *Collema pyrenopsoides*, Nyl. Syn. 1. 103.

GEOG. DISTRIB :—Pyrenees.

BOT. PROV :—19.

IRELAND :—Kenmare, Kerry. *Adm. Jones*. (1866).

6. *P. diffundens*, Nyl. black, opaque, thin, *areolate-squamulose*, *squamulae* somewhat *chaffy*, small, variable.

effuse ; *apothecia rufescent, innate, often gyalectoid*, but variable, and somewhat plane, internally entirely pale ; spores 8, colourless, ellipsoid, simple ; paraphyses distinct, slender ; *gelatina hymenea* at first blue then vinous-red with iodine.

On green-sand rocks, rare. 1865.

SYN :—Nyl. in Flora, 1865, p. 602, Crombie En. 3.

BOT. PROV :—3.

ENGLAND :—Near Maidstone, Kent. *Adm. Jones*. (1865).

7. *P. fuscicula*, Nyl. *darkly fuscous or brown-black*, minute, *noduloso-granulate*, effuse, granules *agglomerate* and confluent in *depressed glomerules*, more or less distinct, or irregularly scattered ; “*apothecia non rite evoluta visa*.”

On maritime rocks, rare. 1866.

SYN :—Nyl. En. Gen. p. 144. (1853),

GEOG. DISTRIB :—France.

BOT. PROV :—31.

CHANNEL ISLANDS :—Noirmont and La Moye, Jersey. *Mr. Lerbalestier*. (1866.)

## II. SYNALISSA. *DR. Nyl.*

Thallus nigricant, minute, of various form, thinly incrusting, submembranaceous, granulose, fruticuloso-divided, granula gonima in globular cells ; apothecia innate, concolorous, lecanorine or endocarpoid. *Spermatia* oblong.

1. *S. symphorea*, (DC.) *black, fastigiato-divided*, branches terete, obtuse, sometimes only *noduliform* ; *apothecia terminal*, concolorous, *punctiformi-impressed*, at length dilated, *thalline margin tumid* ; spores 8-24, colourless, ellipsoid or spherical, simple.

On maritime calcareous rocks, rare.

SYN :—*Collema*, DC. Fl. Fr. 2. 388. *Collema synalissum*, Ach. L.U. 640. Syn. 317. *Synalissa*, Nyl. Syn. 1. 94.

FIG :—Hepp Sporen t. 11, f. 89.

EXS :—Zw. 366. Hepp 89. Anzi It. S. 1, Anzi Venet. 6.

GEOG. DISTRIB :—Central Europe, France, Pyrenees, Germany, Italy, Algeria.

BOT. PROV :—1.. 25.

ENGLAND :—St. Vincent's Rocks, near Bristol. *Dr. Thwaites*. Baddicombe, Devon. *Adm. Jones*.

## III. COLLEMA. *Ach. Nyl.*

Thallus very various, granula gonima *moniliform*, no



distinct cortical layer. Apothecia rufescent, lecanorine. Spores 8, simple or variously divided, septate and murali-locular.

\* *Spores simple.*

1. *C. chelazanum*, Ach. black, difformi-lobate or laciniate, margins *crenulato-granulate*; apothecia rufous, small, thalline margin tumid; spores 8, colourless, ellipsoid, simple; paraphyses slender; gelatina hymenea vinous-red with iodine; spermatia slender, obtuse at each apex.

On sub-alpine calcareous rocks, rare. 1834.

SYN:—Ach. L.U. 633. (1810); Syn. 104. Nyl. Scand. 28. Carroll in Seem. Journ. Bot. 4. 22.

FIG:—Hepp Sporen t. 75, f. 661.

EXS:—Zw. 164. Anzi Venet. 7. Hepp 661.

GEOG. DISTRIB:—Germany, Italy, Switzerland.

BOT PROV:—1...5...19, 20.

ENGLAND:—Chedder. Mr Borrer. St. Vincent's Rocks, Bristol. Mr. Thwaites.

SCOTLAND:—Appin. Rev. J. M. Crombie.

IRELAND:—Near Dunkerron, Kerry, Mr. J. Taylor. (1834). near Fermoy. Mr. T. Chandler.

2. *C. chalazanodes*, Nyl. black, difformi-lobate or laciniate, *crenulato-lobate*; apothecia rufous, small, thalline margin tumid; spores 8, colourless, *sub-globose*, simple, small.

On mossy walls, rare. 1869.

SYN:—Nyl. in Flora, 1860. p. 293. Crombie En. 4.

GEOG. DISTRIB:—Norway.

ENGLAND:—Bradley wood, near Newton Bushell, Devon! Dr. Holl. (1869).

3. *C. furfureum*, Nyl. fuscous-black or black. when moist *rubricoso-nigricant* or *rubricoso rufescent*, *granulato-areolate*; apothecia nearly *urceolariform*; spores 8, colourless, ellipsoid, simple; gelatina hymenea vinous-red with iodine.

On alpine rocks, rare. 1864.

SYN:—Nyl. in Flora, 1865. p. 353. Carroll in Seem. Journ. Bot. 3. 286.

BOT. PROV:—15.

SCOTLAND:—Summit of Ben Lawers!; near Loch Tay and in Glen Dochart. Adm. Jones. (1864.)

4. *C. furfurillum*, Nyl. black or fuscous-black, either entirely *furfuraceo-granulose* and effuse, or *dispersed* in

small furfuraceous verruce, with larger convex fertile granules intermixed; apothecia subpyrenodeo-lecanorine impressed in the fertile granules; spores 8, colourless, shortly ellipsoid, simple; paraphyses distinct; gelatina hymenea vinous-red with iodine; spermatia oblongo-cylindrical.

On alpine rocks, very rare. 1865.

In external aspect like a *Pyrenopsis*, but with moniliform granula gonima.

SYN:—Nyl. in Sällsk. pro. F. et Fl. Fr. Notis. 4. (n. ser. 1.) p. 229. (1859); Scand. 28. Carroll in Seem. Journ. Bot. 3. 286.

GEOG. DISTRIB:—Finland, Sweden.

BOT. PROV:—15.

SCOTLAND:—Summit of Corbuie, in Breadalbane. *Adm. Jones*. (1865); Meal Girdy. *Rev. J. M. Crombie*.

5. *C. confertum*, Ach. nigricant, small, crowdedly and turgidly squamulose, squamules generally cyathoid or podetiiform, nearly all fertile; apothecia (one in each thalline squamula or lobe, urceolate at the summit) subconcolorous, impressed, thalline margin tumid; spores 8, colourless, ellipsoid or fusiformi-ellipsoid, simple; paraphyses slender; gelatina hymenea and especially asci blue with iodine.

On the earth, rare. 1810.

SYN:—Ach. L.U. 624. (1810); Nyl. in Flora, 1867. p. 330.

BOT. PROV:—4.

ENGLAND:—Yarmouth. *Mr. D. Turner*. (1810.)

6. *C. lichinodeum*, Nyl. fuscous-black, linearilaciniose, laciniae ligulate, 2-3-divided, apices obtuse, internally almost as in *Ephebe* but with small, brown, moniliform gonima; apothecia unknown.

On decaying mosses on alpine rocks, rare. 1865.

SYN:—Nyl. in Flora, 1869, p. 293. Carroll in Seem. Journ. Bot. 3. p. 287.

GEOG. DISTRIB:—Prussia.

BOT. PROV:—15.

SCOTLAND:—Summit of Ben Lawers!, plentiful but sterile. *Adm. Jones*. (1865.)

\*\* Spores 3-septate.

7. *C. pulposum*, (Bernh.) dark green or fusco-olivaceous, orbicular, lobate, lobes subimbricate, often plicate; apothecia rufescent, moderate, plane, thalline

margin entire ; spores 8, ovoid, 3-septate, often with longitudinal septa.

On calcareous earth in sub-alpine places, not unfrequent. 1785.

SYN :—Bernh. in Schrad. Journ. Bot. 1799, vol. 1. p. 7. Ach. Syn. 311. Nyl. Scand. 30.

FIG :—Bernh. l. c. t. 1. f. 1. Schær. En. t. 10, f. 5. E. Bot. t. 834.

EXS :—M. & N. 1057. Schær. 428-430. Zw. 160, 161, 163. 165.

GEOG. DISTRIB :—Central Europe, North Africa, Asia, North America, Scandinavia.

BOT. PROV :—1, 2, 3, 4, 5...12...15...19.. 31.

ENGLAND :—Oxford. *Dr. Sibthorp*. Cambridge, *Rev. R. Relhan*. (1785.) Cumberland! *Mrs. Stanger*. Clifftops, between Newhaven and Rottingdean ; Crocker Hill, Slindon ; Horsham Church ; Southover, Lewes ; Hurstpierpoint ; Tunbridge Wells. *Mr. Borrer*. Budleigh Salterton. *Prof. Dickie*. High Rock near Bridgnorth, Shropshire !

SCOTLAND :—Northern parts. *Rev. J. M. Crombie*.

IRELAND :—On walls, frequent. *Mr. Carroll*. Killarney. *Dr. Carrington*.

CHANNEL ISLANDS :—Doyle Pillar, Guernsey ! *Mr. Lerbalestier*.

Var. *tenac*, Ach. darkly glaucescent or virescent ; apothecia rufous, innate, thalline margin less prominent.

On earth, not common. 1811.

SYN :—Ach. Syn. 814. (1817). Nyl. Scand. 30.

FIG :—E. Bot. 2349. Hepp Sporen t. 11, f. 87.

EXS :—Leight. 105, 290. Mudd 1. Hepp 87.

GEOG. DISTRIB :—Switzerland.

BOT. PROV :—2...5...7...10 ..16...19.

ENGLAND :—Oswestry, Shropshire. *Rev. T. Salwey*. Ayton ! Cleveland. *Mr. Mudd*. Sussex ! *Mr. Borrer*.

SCOTLAND :—Appin. *Rev. J. M. Crombie*.

IRELAND :—Blackstone Bridge, co. Cork. *Mr. Carroll*.

WALES :—North Wales. *Rev. Hugh Davies*. (1811.) Barmouth ! Between Llangollen and Corwen !

8. *C. melanum*, Ach. *nigricant* or *nigro-olivaceous*, orbiculate, laciniate, laciniae elongate, convex beneath, margins elevated, undulato-crispate, crenate, sometimes complicate ; apothecia reddish-brown, plane or somewhat concave, thalline margin crenulate ; spores 8, colourless, ovoid, 2-3 septate and longitudinally divided, irregularly murali-locular ; gelatina hymenea intense blue with iodine.

On calcareous rocks, frequent. 1741.

SYN :—Ach. Syn. 315. (1817). Nyl. Scand. 29. *C. multifidum*, Schær. En. 254. *Lichen marginalis*. Huds. Fl. Angl. 534.

FIG :—E. Bot. t. 1924.

EXS :—M. & N. 455. Zw. 154, 155.

GEOG. DISTRIB :—Central Europe, Germany, Pyrenees, Scandinavia.

BOT PROV:—1..5...7, 8..10, 11...14...17.. 19...26, 27.. 30, 31.

ENGLAND :—Derbyshire ; near Settle and Kirkby Lonsdale, Yorkshire : *Sir J. E. Smith*. Lucton, co. Hereford. *Mr. Littleton Brown*. (1741,) Northern Counties. *Mr. Hudson*. Pentregear near Oswestry. *Rev. T. Salwey*. Teesdale. *Mr. Robertson*. St. Michael's, Torquay. *Mr. Borrer*. Berwick-on-Tweed. *Dr. Johnston*. Abdon! Shropshire.

SCOTLAND :—Highlands. *Sir J. E. Smith*. Coyzach, Sutherlandshire. *Mr. Borrer*. near Edinburgh. *Mr. Stewart*.

IRELAND :—Near Belfast. *Mr. Templeton*. Bantry. *Miss Hutchins*. near Galway. *Dr. Moore*. Middleton, near Cork. *Mr. Carroll*. Bulben, Sligo. *Dr. Dickie*.

WALES :—Caernarvon. *Mr. Hudson*. near Cefn House, Denbighshire. *Mr. Griffith*.

CHANNEL ISLANDS :—Quenvais, Jersey! *Mr Larbalestier*.

Var. *complicatum*, Schær. laciniae elongate, somewhat concave, imbricato-lobulate, lobes complicate, margins entire ; apothecia large.

On calcareous rocks, frequent.

SYN :—Schær. Enum. 255. (1850) ; Crombie En. 5.

FIG :—Schær. En. t. 10, f. 4.

EXS :—Schær. 418, 419.

GEOG. DISTRIB :—Switzerland.

BOT. PROV:—16.

ENGLAND :—Teesdale. *Mr. Baker*.

SCOTLAND :—Killin. *Rev. J. M. Crombie*.

9. *C. cheileum*, Ach. dark-olive or fusco-nigricant, lobate or crenato-granulose ; apothecia rufous, plane, moderate, thalline margin granulate ; spores 8, colourless, oblongo-ellipsoid, 3-septate, or submurally-divided.

On walls and calcareous rocks, frequent.

SYN :—Ach. Syn. 310. Nyl. Scand. 31.

FIG :—Hepp Sporen. t. 105, f. 923.

EXS :—M. and N. 1056, 456. Nyl. 4. Schær. 425. Zw. 157, 158. Mudd. 3. Hepp 923. Larbal. 52.

GEOG. DISTRIB :—Central Europe, Sweden, Algeria.

BOT. PROV :—1, 2...6...10...15...19...31.

ENGLAND :—Pinchingthorpe, Yorkshire. *Mr. Mudd*. Torquay. *Mr. Parfit*. Near Hastings ; and near Shanklin, Isle of Wight. *Dr. Holl*.

SCOTLAND :—Northern parts. *Rev. J. M. Crombie*.

IRELAND :—Killarney. *Mr. Hardy*.

WALES :—Pyle, Glamorgan. *Dr. Holl*.

CHANNEL ISLANDS :—Quenvais, Jersey. *Mr Larbalestier*.

10. *C. biatorinum*, Nyl. *fuscous* or *fusco-virescent*, *granuloso-lobulate*, *imbricate*; *apothecia rufescent*, *biatorine*, moderate, *urceolate*, *gyalectiform*; spores hyaline, ovoid, 3-4-septate, sparingly longitudinally divided; gelatina hymenea and asci blue with iodine.

On mossy walls, rare. 1866.

Approaching in structure to *Leptogium*.

SYN:—Nyl. Prodr. 22. (1857); Syn. 110. Carroll in Seem. Journ. Bot. 4. 22.

GEOG. DISTRIB:—France.

BOT. PROV:—3.

ENGLAND:—Maidstone, Kent. *Adm. Jones*. (1866.)

11. *C. auriculatum*, Hffm. *dark-green* or *darkly viridi-glaucous*, *rigid*, opaque, dilated, *lobate*, lobes somewhat imbricate, *more or less granulose*, irregularly repando-crenate; *apothecia rufous*, *innate* or *emergent*, *margin thick*, *more or less granulose*; spores 8, colourless, ovoid, 3-septate.

On mossy walls in sub-alpine localities, rare. 1869.

SYN:—Hffm. Fl. Germ. 2. p. 98. (1795); Nyl. Syn. 106. Crombie in Seem. Journ. Bot. 8. 96.

FIG:—Schær. Enum. t. 10, f. 3.

EXS:—Zw. 162. A.B. Schær. 432.

GEOG. DISTRIB.—Switzerland, France, Germany.

SCOTLAND:—Appin, Argyshire. *Rev. J. M. Crombie*. (1869.)

12. *C. crispum*, Ach. *olivaceo-virescent* or *fusco-virescent*, *orbicular*, *lobato-divided* or subradiate, *margin granulate* and crenate; *apothecia darkly rufescent*, *thalline margin granulate*; spores 8, colourless, ovoid, 3-septate, irregularly muriformi-locular.

On gravelly earth, frequent. 1831.

SYN:—Ach. Syn. 312. (1817); Nyl. Scand. 30.

FIG:—E. Bot. Suppl. t. 2716. f. 1.

EXS:—Leight. 106. Mudd 2. Zw. 159. Fellm. 7.

GEOG. DISTRIB:—N. and Central Europe.

BOT. PROV:—1, 2...10.. 11...14, 15, 16...19, 20...31.

ENGLAND:—Sussex. *Mr. Borrer*. (1831); Coatham Marshes near Redcar, Cleveland. *Mr. Mudd*. Dawlish. *Mr Parfitt*. Huddershead, Berwick-on-Tweed. *Dr. G. Johnston*.

SCOTLAND:—Appin and Killin. *Rev. J. M. Crombie*. near Edinburgh. *Dr Greville*. Forfarshire. *Mr. G. Don*.

IRELAND:—On limestone rocks and walls, common. *Mr Carroll*.

CHANNEL ISLANDS:—Shore of Herm. *Mr Lerbalestier*. Guernsey. *Rev. T. Salvey*.

13. *C. limosum*, Ach. *dark-green*, *thin*, *appressed*,



lobes small, scattered, thick and pulpy when moist, slightly crenulate; *apothecia* rufous, plane, moderate, margin prominent, entire or slightly crenulate; spores 8, colourless, ovoid, 3-septate, with occasional longitudinal septa.

On wet clayey soil, not unfrequent. 1831.

SYN:—Ach. L.U. 639. Syn. 309. Nyl. Scand. 30.

FIG:—E. Bot. Suppl. t. 2704. f. 1.

GEOG. DISTRIB:—France, Sweden.

BOT. PROV:—2.

ENGLAND:—Hurstpierpoint, Sussex. *Mr. Borrer*. (1831)

14. *C. microphyllum*, Ach. dark olive or fuscous-green, microphylline, imbricated, lobes granulate-crenate, minute, often verrucoso-diffract, effuse; *apothecia* pallido-rufescent, small, crowded, urceolato-concave, thalline margin nearly concolorous, entire; spores 8, colourless, ovoideo-ellipsoid, 3-septate; gelatina hymeneae blue with iodine.

On old trees, rare. 1810.

SYN:—Ach. L.U. 630. (1810); Syn. 310. Nyl. Syn. 113.

FIG:—E. Bot. Suppl. t. 2721.

EXS:—M. & N. 948. Zw. 168. Nyl. 5. Schær. 411. Leight. 258.

GEOG. DISTRIB:—Central Europe, France, Sweden, Germany, Switzerland, Algeria.

BOT. PROV:—1, 3, 4, 5, 10.

ENGLAND:—Near Bury St. Edmund's, Suffolk. *Rev. G. R. Leathes*. (1810); Dunsford, near Exeter, Devon. *Mr. Parfitt*. Ingleby Park, Cleveland. *Mr. Mudd*. Lyndhurst, New Forest. *Rev. J. M. Crombie*. Danny; Ockley Green, Surrey. *Mr. Borrer*. near Worcester. *Dr. Holl*.

15. *C. plicatile*, Ach. fusco-virescent, imbricato-lobate, lobes erect or ascending, acutely plicate, crisped at the margin; *apothecia* rufescent, scattered, entirely margined by the thallus; spores 8, colourless, broadly fusiformi-ellipsoid, generally 3-septate; gelatina hymeneae blue with iodine; spermatia incrassate at either apex.

On maritime rocks, not unfrequent. 1811.

SYN:—Ach. Syn. 314. pro. p. (1817); Nyl. Syn. 109.

FIG:—E. Bot. t. 2348.

GEOG. DISTRIB:—Central Europe, Norway, Sweden, Algeria.

BOT. PROV:—1, 2...7...16...19...31.

ENGLAND:—Southover, Lewes: Old Shoreham; St. Michael's. Tor near Torquay; Steyning; Albourne. *Mr. Borrer*.

SCOTLAND:—Appin. *Rev. J. M. Crombie*.

IRELAND:—Killarney. *Mr. Hardy*.

WALES :—North Wales. *Mr. Griffith.* (1811.) Barmouth.

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.*

16. *C. conglomeratum*, (Hffm.) dark-green or fusco-vireseent, suborbicular, crenato-lobulate, generally in erect, sub-podicellate conglomerations, dilated upwards, (with iodine blood-red) ; apothecia rufescent, crowded, biatorine, somewhat convex, margin thin, undulate ; spores 8, colourless, fusiform, 3-septate.

On old trees, rare. 1741.

SYN :—Hffm. Fl. Germ. p. 102. (1795) ; Ach. Syn. 317. Nyl. Syn. 115.

FIG :—E. Bot. t. 1162. Nyl. Syn. t. 3, f. 1.

EXS :—Zw. 167. Nyl. 102.

GEOG. DISTRIB :—Central Europe, France, Germany.

BOT. PROV :—2, 3, 4 ..7...11, 12, 13.. 15, 16.

ENGLAND :—St. Leonard's Forest, Sussex ; Oxford. *Dillenius.* (1741) ; Ambleside. Westmoreland. *Sir J. E. Smith.* Gogmagog Hills ; Newmarket Heath, Cambridge. *Rev. R. Relhan.* N.E. side of Stiperstones, Shropshire. *Rev. E. Williams.*

SCOTLAND :—Near Lake Katrine ; Appin ; Fort William. *Rev. J. M. Crombie.* Aberfeldy, and near Keumore. *Dr. Holl.* Forfarshire. *Mr. G. Don.* Dumfriesshire. *Dr. Burgess.*

WALES :—Nant Glyn, Denbighshire. *Mr Griffith.*

17. *C. ceranoides*, Borr. olive-brown, sub-virescent, or nigricant, rotundato-pulvinular, lobate, lobes imbricated, ascending, dilated upwards, proliferous, narrowly and elongato-laciniate, laciniae subcylindrical, graniform, fastigiate, crowded, turgid ; apothecia brown, sessile, convex, margin entire or crenulate or elongato-granulate ; spores 8, colourless, 3-septate.

On chalk, rare. 1831.

SYN :—Borrer in E. Bot. Suppl. 2704. (1831) ; Crombie En. 6.

FIG :—E. Bot. Suppl. t. 2704. f. 2.

BOT. PROV :—2, 3...5.

ENGLAND :—Boxgrove, near Chichester. *Mr. R. J. F. Thomas.* (1831) ; Sussex Downs. *Mr. Borrer.* Henham, Essex. *Mr. Forster.* Lamforda garden wall, near Oswestry. *Rev. T. Salwey.*

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.*

18. *C. ceraniscum*, Nyl. brownish-olive, or greenish-black, caespitose, laciniato-lobate, lobes dilated upwards, erect, crowded, fastigiate, elongato-cylindrical, obtuse ; apothecia pale brown, minute, plane, thalline margin smooth, thin, granulate ; spores 4, colourless, broadly oblong, 3-septate or irregularly murali-locular.

On earth in alpine localities, very rare.

SYN:—Nyl. in Flora, 1865, p. 353. *C. ceranoides*. Mudd Man. 41, (non Borr.) Carroll in Seem. Journ. Bot. 3. 287.

BOT. PROV:—15.

SCOTLAND:—Summit of Ben Lawers. *Adm. Jones*.

19. *C. fluviatile*, (Huds.) dark olive or olive-black, coriaceo-membranaceous, luxly imbricated, lobate, lobes oblong or obovate, convex, proliferous, canaliculate beneath; apothecia brown, small, globular, sessile, concave, thalline margin smooth, pale; spores 8, colourless, obovate, 3-septate, irregularly murali-locular.

On rocks in mountain streams, rare. 1724.

SYN:—Hudson Fl. Ang. 534. Ach. Syn. 314. Mudd. Man. 40.

FIG:—E. Bot. t. 2039.

BOT. PROV:—7...10...13...15.

ENGLAND:—Malham Cove, Yorkshire. *Dr. Richardson*. (1724).

SCOTLAND:—River Isla in Clova. *Rev. J. M. Crombie*. Bonnington Fall, Lanark. *Mr. Borrer*.

WALES:—Snowdon. *Dillenius*. In River Elwy, about half-way from the ford opposite the cave to Pontnewydd, 4 miles from Denbigh. *Mr Griffith*.

20. *C. furvum*, Ach. dark fuscous-green or nigro-olivaceous, membranaceous, granulate, lobate, lobes complicate, often undulate, bloody-red with iodine; apothecia fuscous, plane, thalline margin entire; spores 8, colourless, ovoid or ellipsoid, 3-septate, irregularly murali-locular.

On sub-alpine rocks, not unfrequent. 1741.

SYN:—Ach. Prodr. 132. (1798). Nyl. Scand. 29. *C. tunaforme*. Ach. Syn. 332. *Lichen granulatus*, Sm.

FIG:—E. Bot. t. 1757.

EXS:—Hepp 414.

GEOG. DISTRIB:—Europe, Sweden. Finland. Switzerland.

BOT. PROV:—1, 2, 3...5...7...10, 11, 12...19.. 30.

ENGLAND:—Oxford, *Dillenius*. (1741); near Kirkby Lonsdale. *Sir J. E. Smith*. Shanklin. *Rev. T. Salwey*. Bolton Woods and Ingleborough, Yorkshire. *Dr. Carrington*. Frosterley; and Stanhope, Wear Valley, Durham. *Mr. Mudd*. S. Devon; Isle of Wight; Torquay. *Dr. Holl*. Pentregaer near Oswestry. *Rev. T. Salwey*.

IRELAND:—Near Belfast. *Mr. Templeton*. Dunkerron. *Dr. Taylor*. Killarney. *Dr. Carrington*.

WALES:—Garregwen rocks. *Mr. Griffith*.

\*\*\* *Spores pluri-septate*.

21. *C. nigrescens*, L. nigro-virescent, thin, membranaceous, submonophyllous, orbicular, depressed, rotundato-

lobate, *radiato-rugoso-plicatulate*, naked or granulate, *ascending in the centre, depresso-adnate at the circumference*; apothecia dark-rufous, plane, small, crowded, thalline margin entire; spores 8, colourless, fusiformi-cylindrical, pluri-septate.

On old trees, not unfrequent. 1741.

SYN:—Linn. Suppl. Pl. p. 451. (1781); Ach. Syn. 321. Nyl. Syn. 184. *Lichen vespertilio*. Lightf. Scot. p. 840.

FIG:—Hffm. Pl. Lich. t. 37, f. 2. 3.

EXS:—M. & N. 164. Leight. 109. Schær. 410.

GEOG. DISTRIB:—Europe, Algeria, America, Asia, Polynesia, N. Zealand.

ENGLAND:—Bagley Wood, near Oxford. *Dillenius* (1741). Shot-over Plantations, near Oxford. *Dr. Sibthorp*. Cambridgeshire. *Rev. R. Rolhan*, near Bungay. *Mr. Woodward*, near Holsworthy, Devon. *Mr. Newberry*, Sussex. *Mr. Borrer*, Exeter. *Mr. Pargitt*, Malvern; Sussex; Isle of Wight; S. Devon; and Cornwall generally. *Dr. Holl*, Clapham; Kempston, Beds. *Rev. C. Abbot*, Pontesford Hill and Pulverbatch, Shropshire. *Rev. E. Williams*.

SCOTLAND:—Grampians. *Rev. J. M. Crombie*, near Kenmore and Killin, Perthshire. *Dr. Holl*, near Edinburgh. *Dr. Greville*, Reeky Linn; Den of Glammis; Glen Dole, Forfarshire. *Mr. W. Gardiner*.

IRELAND:—On old trunks frequent, *Mr. Carroll*.

CHANNEL ISLANDS:—Guernsey. *Rev. T. Salwey*.

22. *C. flaccidum*, Ach. dark-green or fuscous-green, membranaceous, *undulato-plicate*, lobate, lobes large, expanded, *fleucose*; apothecia rufescent, plane, margin entire; spores 8, colourless, ovoid or broadly fusiformi-oblong, 4-6-septate.

On rocks and walls, not unfrequent. 1783.

SYN:—Ach. Syn. 322. (1817). Nyl. Scand. 29.

FIG:—E. Bot. t. 1653.

EXS:—M. & N. 1059. Zw. 166. Schær. 412. Leight. 345.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1, 2...5...7...10...12...15.. 19, 20 . 26, 27 ..30.

ENGLAND:—Pyecombe, Westmoreland. *Sir J. E. Smith*. (1783) Devonshire. *Mr. Dickson*, Pyecombe, Sussex. *Mr. Borrer*, Sidmouth. *Rev. T. Salwey*, Bolton Woods. *Dr. Carrington*, near Exeter. *Adm. Jones*, Rievaulx, Yorkshire. *Mr. Baker*, Holwick, Yorkshire. *Mr. Robertson*, Plymouth and Budleigh Salterton. *Mr. Pargitt*, Llanymynech Hill! Shropshire.

SCOTLAND:—Northern parts. *Mr. Dickson*, Kinnoull Hill, Perth. *Dr. Lindsay*, Killin. *Rev. J. M. Crombie*, Kenmore, Perthshire. *Dr. Holl*, Reeky Linn; Clova. *Mr. G. Don*.

IRELAND:—Bantry. *Miss Hutchins*, Mallow and Castlemartyr, co. Cork. *Mr. Carroll*, Moyne Abbey, co. Mayo and Ben Bulbin,

Sligo. *Dr. Dickie*. Killarney. *Dr. Carrington*. Aghalee Bridge, Lagan Canal. *Dr. Moore*.

WALES :—Trecastle ; Cader Idris. *Mr. Ralfs*. Harlech. *Mr. Borrer*. Corsygedol ; Rhaiadr Du, near Barmouth. *Rev. T. Salwey*. Barmouth !

*Var. microlobum*, Nyl.

BOT. PROV :—19.

IRELAND :—Muckruss, Killarney. *Mr. Hardy*.

23. *C. aggregatum*, Ach. *nigro-virescent*, membranaceo-lobate, *rigid*, plicate, *not radiato-rugose*, *nor appressed*, difformed, lobes crenate, *margin granuloso-crispate* ; apothecia rufous, crowded, moderate, plane, thalline margin thin, entire ; spores 8, colourless, fusiform-cylindrical, straight or curved, pluri-septate.

On old trees and rocks, rare.

SYN :—Ach. Syn. 317. (1817) ; Nyl. Syn. 115.

FIG :—Nyl. Syn. t. 2. f. 9.

EXS :—M. & N. 453.

GEOG. DISTRIB :—Europe, Asia, America, Polynesia.

BOT. PROV :—2.. 19.

ENGLAND :—Henfield, Sussex. *Adm. Jones*.

IRELAND :—Killarney. *Dr. Moore*.

24. *C. multipartitum*, Sm. *fusco-olivaceous* or *nigrescent*, *laciniate*, *radiate*, *laciniae narrow*, *multifid*, somewhat convex, *lobato-partite at the apex*, lobes divergent ; apothecia atro-rufous, moderate, plane, thalline margin thickish, even ; spores 8, colourless, cylindrical, curved, oleoso-ocular ; paraphyses thick, pauci-articulate.

On sub-alpine calcareous rocks, not unfrequent. 1782.

SYN :—Sm. E. Bot. 2582. (1814) ; Nyl. Syn. 116.

FIG :—E. Bot. t. 2582. Nyl. Syn. t. 2. f. 8.

BOT. PROV :—1...5...7, 8...10, 11, 12...16.. 19...26...28

ENGLAND :—Kendal, Westmoreland. *Sir J. E. Smith*. (1782.) Devonshire. *Adm. Jones*. Moelydd and Pentregaer, near Oswestry. *Rev. T. Salwey*. Cheddar ; Weathercote, Yorkshire ; *Mr. Borrer*. Middleton Beck, Durham. *Mr. Robertson*. Buxton. *Dr. Holl*. Abdon Burf ! Shropshire.

SCOTLAND :—Appin. *Rev. J. M. Crombie*. Ben Lawers. *Dr. Holl*.

IRELAND :—Killarney. *Sir T. Gage*. Dunkerron. *Dr. Taylor*. Middleton, near Cork. *Mr. Carroll*. Sheepwalk, Armagh. *Adm. Jones*. Castle Taylor, Galway. *Dr. Moore*.

WALES :—Little Orme's Head !

\*\*\*\* *Spores murali-divided*.

25. *C. psorillum*, Nyl. *nigricant* or *fuscous-black*, thin, *rugoso* or *sub-granulato-unequal*, *diffract*, deter-



minate, *internally glomerulose*; apothecia rufescent or fusco-rufous, small, sub-biatorine, margin obtuse, at length obliterated; spores 8, colourless, ellipsoid, sub-murali-divided; gelatina hymenea intensely blue with iodine.

On alpine rocks, very rare. 1866.

SYN:—Nyl. in Flora, 1865. p. 602. Carroll in Seem. Journal Bot. 4. 22.

BOT. PROV:—15.

SCOTLAND:—Ben Lawers. *Adm. Jones*. (1866.)

#### IV. LEPTOGIUM. Ach.

Thallus very various, thin, granula gonima moniliform, cortical layer cellulose, distinct. Apothecia lecanorine or sub-biatorine. Spores 8, variously septate or divided.

##### \* *Spores simple.*

1. *L. Mooreii*, Hepp. *pale slaty-grey or olive-blue*, shining, *byssoid, depresso-pulvinar, filaments fasciculate, dichotomously branched, terete, flexuose, apices obtuse, divaricato-bifid*; apothecia *flesh-coloured, very minute, hemispherical or oval, convex, immarginate, laterally adnate on the filaments*; spores numerous, oval, simple, *very minute*.

On mossy trunks in mountainous regions, rare. 1861.

SYN:—Hepp. in litt. MS. *Ephebe byssoides*, Carrington in Trans. Bot. Soc. Edinb. 7, 411. Carroll in Seem. Journ. Bot. 3. 287.

FIG:—Trans. Bot. Soc. Edinb. 7. t. 10. f. 2.

BOT. PROV:—19, 20.

IRELAND:—Glena, Killarney. *Dr. Carrington*. (1861); Glengariff! *Adm. Jones*.

##### \*\* *Spores 1-septate.*

2. *L. muscicola*, (Sw.) *fuscous, or olivaceo-fuscescent*, small, *pulvinar, fruticulos-ramose*, branches *filiformiterete or sub-compressed, intricate, apices slightly attenuate*; apothecia *fusco-rufescent or fuscous, terminal, appressed, concave, margin thin, smooth, entire, paler*; spores 8, colourless, oblongo-fusiform, 1-septate.

On mossy rocks and walls in sub-alpine districts, rare. 1790.

SYN:—Swartz. Nat. Act. Ups. 4. 248 (1784); Ach. Syn. 328. Nyl. Syn. 134. Scand. 36.

FIG :—Dicks. Br. Crypt. 2. t. 6. f. 9. Schær. En. t. 10. f. 1. b. E. Bot. t. 2264. Nyl. Syn. t. 4. f. 11...15.

Exs :—Zw. 175. M. & N. 949. Schær. 403. Leight. 395. Anzi Langob. 12. Fellm. 11.

GEOG. DISTRIB :—Europe, France, Scandinavia, Sweden, Russia, Pyrenees, Germany, Italy, Algeria.

BOT. PROV :—1...5...7...10, 11...15...22...31.

ENGLAND :—Eglestone, Durham. *Rev. J. Harriman*. Oswestry ! *Rev. T. Salwey*. Lanbraughrigg ! Cleveland. *Mr. Mudd*. Blackstone Rock, Dartmoor. *Prof. Dickie*. South Brent, Devon. *Dr. Holl*.

SCOTLAND :—Scotch Alps. *Mr. Dickson*. (1790) ; Grampians. *Rev. J. M. Crombie*. Ben Lawers ; Loch Dochart, Perthshire. *Dr. Holl*.

IRELAND :—Luggelaw, co. Wicklow. *Adm. Jones*.

WALES :—Garthmeilio. *Mr. Griffith*. Barmouth ! ; Cross Foxes ! near Dolgelley.

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey*. Quenvais, Jersey. *Mr. Larbalestier*.

\*\*\* *Spores 3-septate.*

3. *L. turgidum*, (Ach.) dark olive-green, thick, rotundato-lobate, smooth or granulated, lobes turgid, ascending and imbricated in the centre, concave, undulate and plicate at the circumference ; apothecia reddish brown or nigricant, moderate, plane ; margin thick, turgid, more or less granulate ; spores 8, colourless, oblong or ovato-oblong, 3-septate.

On rocks and sandstone walls, not common.

SYN :—Ach. L. U. 634. (1810) : Syn. 313. Nyl. Scand. 36.

Exs :—Schær. 433. Hepp. 215. Leight. 257.

GEOG. DISTRIB :—France, Switzerland.

BOT. PROV :—3, 4, 5...10.

ENGLAND :—Near Scarborough, *Mr. Hailstone*. Malham, Yorkshire. *Dr. Carrington*, Leigh Woods ! Clifton. *Mr. Larbalestier*. Gorlestone Church ; Dunwich, Suffolk. *Mr. D. Turner*. Southover Priory. *Mr. Jenner*. between Horsham and Guildford, *Mr. Borrer*. near Malvern. *Dr. Holl*. Upton, near Shifnal, Shropshire !

4. *L. tremelloides*, (L.) plumbeo-glaucous or plumbeo-olivaceous, thin, membranaceous, smooth, lobate, imbricated and crispate ; apothecia rufous or rufescent, elevated, urceolate or plane, margin thick, entire, elevated, lead-coloured ; spores 8, colourless, ellipsoid, 3-septate, irregularly murali-locular.

On sub-alpine and maritime rocks, frequent. 1782.

SYN :—Linn. Suppl. Pl. 450. (1781) ; Ach. Syn. 325. Nyl. Syn. 124. Scand. 35.

FIG :—E. Bot. t. 1981. Nyl, Syn. t. 2. f. 7.

EXS :—M & N. 1060, Schaer. 409. Anzi Langob. 10. Lindig 46.

GEOG. DISTRIB :—Central Europe, France, Italy, Scandinavia, Sweden, Finland, Cuba, Amazons, N. Zealand, Ceylon, Rio Janeiro, N. Granada.

BOT. PROV :—1...5...7...10...14, 15, 16...19...26.. 29, 30, 31.

ENGLAND :—Devonshire. *Mr. Slater*, Yorkshire. *Mr. Curtis*. Whiteliff Rocks! Ludlow. *Rev. T. Salwey*. Ruan Minor, Cornwall; North Brent Tor, Dartmoor. *Mr. Borrer*. Hornby, Yorkshire. *Mr. Teesdale*. Torquay. *Dr. Holl*.

SCOTLAND :—Dumbarton Castle Rock. *Sir J. E. Smith*. (1782). Inverary. *Mr. Borrer*. Pentland Hills. *Dr. Greville*. Appin. *Rev. J. M. Crombie*.

IRELAND :—Belfast. *Mr. Templeton*. Dargle River. *Dr. Stokes*. Bantry. *Miss Hutchins*. Askew Wood, Kerry. *Dr. Taylor*. Blackwater Bridge, Kerry; Killarney. *Mr. Carroll*. Duufanahy co. Donegal; Moyne Abbey co. Mayo! *Dr. Dickie*.

WALES :—Garn, Denbighshire. *Mr. Griffith*. Hendremynach. *Rev. T. Salwey*. Cwm Bychan, near Harlech. *Mr. Borrer*.

CHANNEL ISLANDS :—Gargate Mill! St. Peter's Valley! Jersey. *Mr. Larbalestier*.

5. *L. dermatinum*, Borr. olive-green or olive brown, subcoriaceous, rotundo-lobate; margins ascending, sinuate or inciso-crenate, smooth or minutely granulate; apothecia rufous, plane, margin narrow, entire or minutely crenulate; spores 8, colourless, ellipsoid, 3-septate, murali-locular.

On calcareous rocks, not common.

SYN :—Borr. in E. Bot. Suppl. t. 2716. (1831).

FIG :—E. Bot. Suppl. t. 2716, f. 2.

BOT. PROV :—1, 2...5, 6, 7...10...12.

ENGLAND :—Leigh Wood, near Bristol. *Mr. Forster*. Keswick; Malham Cove, Yorkshire; New Timber Hill, Sussex. *Mr. Borrer*. Westmoreland. *Mr. Robertson*. Pentregaer, Oswestry. *Rev. T. Salwey*. Devonshire. *Sir W. J. Hooker*.

SCOTLAND :—*Mr. Borrer*.

WALES :—Limestone Rocks! *Mr. Griffith in Herb. Borrer*. Stackpole, Pembrokeshire. *Rev. T. Salwey*.

6. *L. saturninum*, (Dicks.) plumbeo-fuscescent or olivaceo-fuscous, monophyllous and lobato-incised, or polyphyllous and complicate, sinuate and plicate, nigricanti-furfuraceous above, beneath cinereous or albo-cinereous and densely incano tomentellose; apothecia dark rufous, scattered, plane, thalline receptacle cupular and prominent, margin entire; spores 8, colourless, ellipsoid, 3-septate.

On old trunks in sub-alpine localities, rare. 1790.

SYN :—Dicks. Br. Crypt. 2. p. 21. (1790) ; Ach. Syn. 320. Nyl. Syn. 127.

FIG :—Dicks. l. c. t. 6. f. 8. E. Bot. t. 1980. Nyl. Syn. t. 4. f. 16. Hepp Sporen t. 74. f. 652.

EXS :—M. & N. 454. in part. Schær. 424. 500. Anzi Langob. 9. B. 292. Hepp 652.

GEOG. DISTRIB :—Europe, Pyrenees, Italy, Bavaria, Switzerland, Scandinavia, Sweden, E. Lapland, Hungary, Austria, N. America.

BOT. PROV :—11...15, 16.

ENGLAND :—Teesdale, Durham. *Rev. J. Harriman.*

SCOTLAND :—Western parts. *Mr. Dickson.* (1790) ; Killin. *Mr. D. Turner.* Appin. *Rev. J. M. Crombie.* near Aberdeen ! *Prof. Dickie.* Glen Lyon and Glen Lochy, Perthshire. *Dr. Holl.* Forfarshire. *Mr. G. Don.*

\*\*\*\* *Spores 3-4 ; 3-5, or 3-7-septate.*

7. *L. pusillum*, Nyl. *olivaceo-fuscescent* or *virescenti-fuscous*, *most minute*, *adnate*, *lobulato-granulose* ; granula gonima few, moniliform ; cortical layer rather indistinct ; *apothecia rufescent*, *minute*, *elevated*, prominent, in a thalline excipulum whose margin is concolorous with the epithecium ; spores 8, colourless, ovoid, or narrower at either apex, 3-4-septate.

On old walls, very rare. 1867.

SYN :—Nyl. Syn. 121. (1861) ; Scand. 33. Crombie En. 7.

EXS :—(*forma effusa*) Arn. 356 Larbal. 54.

GEOG. DISTRIB :—Sweden, Germany.

BOT. PROV :—1...31.

ENGLAND :—(*Forma effusa*,) Bath. *Dr. Holl.*

CHANNEL ISLANDS :—(*forma effusa*) St. Brelade's ! St. Peters, Jersey. *Mr. Larbalestier.* (1867.)

8. *L. fragrans*, (Sm.) *olivaceo-fuscous* or *virescent* or *nigricant*, *rotundato-lobate*, *lobes minute*, *ascending*, crowded, smooth, *margins thickened*, *crenate* ; *apothecia tawny-brown*, scattered, minute, sessile, convex, *margin entire*, *thick*, *tumid* ; spores 8, colourless, ovato-subpyriform, 3-5-septate, irregularly murali-locular.

On old trees, not common. 1808.

SYN :—Sm. E. Bot. 1912. (1808) ; Mudd Man. 26.

FIG :—E. Bot. t. 1912.

BOT. PROV :—2, 3...5.. 10.

ENGLAND :—Kent, Surrey ; near Blaxton, Billsborough Lane, Woodmancote, Henfield, and Hurstpierpoint, Sussex. *Mr. Borrer.* (1808) ; near Ayton, Cleveland. *Mr. Mudd.* Pembroke, Herefordshire. *Rev. J. F. Crouch.* Forthampton, Gloucestershire. *Mr. Lees.* Llanforda and Pentregaer, near Oswestry. *Rev. T. Salwey.*

9. *L. Burgessii*, (Lightf.) *dark lead-coloured* or *plum-*

*her-fuscescent*, large, *laciniato-lobate*, *complicate*, lobes *crenulate* or *variously dissected*, curled and *crispate* beneath, *cinerascens* and *minutely albido-tomentellose*; apothecia dark-rufous, large, plane or concave, *thalline margin subfoliaceous*, *densely sinuato-laciniate* and *crispate*; spores 8, colourless, ellipsoid, attenuated or apiculate at either apex, 3-5-septate and irregularly murali-locular.

On old trunks in sub-alpine regions, rare. 1774.

SYN :—Lightf. Fl. Scot. 827. (1777); Ach. Syn. 320. Nyl. Syn. 132.

FIG :—Lightf. l. c. t. 26. E. Bot. t. 300. Hepp Sporen t. 106, f. 927.

EXS :—Hepp 927. Maudon 35.

GEOG. DISTRIB :—Denmark, Switzerland, Canaries, America, Amazons, Madeira.

BOT. PROV :—6, 7...12, 13...15, 16...19...30.

ENGLAND :—Cumberland! *Dr. Burgess*. Gowbarrow Park! and Keswick! *Mrs. Stanger*.

SCOTLAND :—On bank of rivulet Duff-Kinnel, near Barntimpen, par. Kirkpatrick; and in Mollin Linn Wood! par. Johnstone. Dumfriesshire. *Rev. Dr. Burgess*. (1774) Scotch Highlands. *Sir W. J. Hooker*. Grampians. *Rev. J. M. Crombie*. Inverary! *Mr. Benthham*. Glen Falloch. *Dr. Holl*.

IRELAND :—Killarney. *Dr. Taylor*. Deer Park, Antrim. *Dr. Moore*.

WALES :—Devil's Bridge and Hafod, Cardiganshire. *Sir J. E. Smith*. Abertygwyn, near Dolgelley. *Dr. Holl*. Garth and Rhaiadr Du, near Barmouth. *Rev. T. Salwey*.

10. *L. subtile*, (Schräd.) *dark dull green*, *microphyl-line*, *laciniate*, *lacinae variously dissected*, narrow, *elongato-lobate*, *imbricated*, internally entirely cellulose; apothecia pallido-rufescent, small, concave, *gyalectoid*, margin thin, entire; spores 8, colourless, ovoid, 3-5 septate with longitudinal septa.

On the earth, rare. 1791.

SYN :—Schräd. Spic. 95 (1794); Nyl. Syn. 121.

FIG :—E. Bot. t. 1008. Mudd Man. t. 1. f. 8.

EXS :—Nyl. 2. Zw. 175.

GEOG. DISTRIB :—Central Europe.

BOT. PROV :—2, 3, 4, 5...10...15...19...31.

ENGLAND :—Near Hale End, Walthamstow; Epping Forest. *Mr. Edw. Forster* (1791); Coltishall, Norfolk. *Mr. D. Turner*. Shanklin, Isle of Wight. *Rev. T. Salwey*. near Ayton, Cleveland. *Mr. Mudd*. New Hall, Henfield, Sussex! *Mr. Borrer*. Newbury, near Worcester. *Dr. Holl*.

SCOTLAND :—Becky Linn. Forfarshire. *Mr. W. Gardiner*.

IRELAND :—"On wet clay, not uncommon" *Mr. Taylor*.



CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey*. Bonne Nuit, Jersey. *Mr. Larbalestier*.

11. *L. chloromelum*, (Sw.) lead-coloured or plumbeo-virescent, membranaceous, lobate, plicate, longitudinally rugose, lobes undulate; apothecia rufous or fusco-rufous, concave or plane, thalline margin thick, rugosoplicate or furfuraceo-granulate; spores 8, colourless, ellipsoid attenuated at either apex, 3-5-septate, with longitudinal septa.

On mossy trunks in sub-alpine regions, rare.

SYN :—Swartz Fl. Ind. Occid. 3. 1892. (1806); Ach. Syn. 321. Nyl. Syn. 128.

EXS :—Wright 8.

GEOG. DISTRIB :—W. Europe, France, Canaries, E. & W. Indies, N. Zealand, Jamaica, Mexico, Brazil, Cuba, Teneriffe.

BOT. PROV :—2. 7. 19.

ENGLAND :—Charlton Forest, Sussex. *Mr. Borrer*.

IRELAND :—Southern Counties. *Miss Hutchins*.

WALES :—Barmouth. *Rev. T. Salwey*. Garth, near Dolgelly. *Dr. Holl*.

12. *L. cretaceum*, Sm. olivaceo-fuscous or olive-brown, microphylline, rosulato-lobulate or stellato-laciniate, lobes unequally crenate, somewhat imbricate; granula gonima simple, rarely moniliform; cortical layer rather indistinct; apothecia rufous, nearly biatorine, concave or gyalectiform, small, margin paler; spores 8, colourless, ovoid, variously divided, 3-7-septate, with longitudinal septa.

On chalk and flint, rare. 1800.

SYN :—Sm. E. Bot. 738. (1800); Ach. Syn. 318. Nyl. Syn. 120.

FIG :—E. Bot. t. 738.

GEOG. DISTRIB :—France.

BOT. PROV :—2, 3, 4.

ENGLAND :—Eastern Counties. *Dr. Nothden*. (1800); Kent and Sussex. *Rev. J. M. Crombie*, near Lewes, Sussex. *Mr. Unwin*.

\*\*\*\*\* Spores murali-ocular.

13. *L. lacerum*, (Ach.) plumbeo-fuscescent, membranaceous, longitudinally rugulose or plicatulate, lacero-laciniate, margins ciliato-dentate or dentate and crisped; apothecia pallido-rufous, moderate, rare, margin thick, smooth; spores 8, colourless, ovoid or narrower at either apex, murali-ocular.

On mossy rocks and walls, frequent. 1741.

SYN :—Ach. Prodr. 133. (1798) ; Nyl. Syn. 122. Scand. 33.

FIG :—E. Bot. t. 1982. Nyl. Syn. t. 2. f. 6. Hepp Sporen. t. 106, f. 928.

EXS :—Schaer. 404. Mudd 5. Zw. 172 M. & N. 1061. Anzi Langob. 11. Larbal. 4. Hepp 928.

GEOG. DISTRIB :—Central Europe, Germany, Austria, Sweden, Pyrenees, France, Italy, Algeria, N. America.

BOT. PROV :—1, 2, 3, 4 ..7, 8.. 12, 13, 14, 15,...19...27...30, 31.

ENGLAND :—Westmoreland. *Sir J. E. Smith*. Cambridge. *Rev. R. Relhan*. Oxford. *Dr. Sibthorp*. Baysdale ! Mulgrave Castle ! Cleveland, Yorkshire. *Mr. Mudd*. Torquay ! Devon. *Dr. Drakin*. Charnwood Forest ! and Bardon Hill ! Leicestershire. *Rev. A. Bloom*. Whitestone Cliff ! near Thirsk. *Mr. Baker*. Cutcombe ! Somerset. *Rev. W. H. Coleman*. near Linton ! Devon. *Mr. Lees*. Cheddar ; Eshing, near Godalming. *Mr. Borrer*. Budleigh Salterton. *Prof. Dickie*. near Shanklin, Isle of Wight. *Dr. Holl*.

SCOTLAND :—Grampians. *Rev. J. M. Crombie*. Den of Glammis ; Den of Balthayock. *Mr. W. Gardiner*. High Ashes, Leith Hill. *Mr. Borrer*. Cruglockhart, Edinburgh. *Dr. Greville*. Den of Glammis ; Airlie ; Glen Dole ; Reeky Linn, Forfarshire. *Mr. W. Gardiner*. Grey Mare's Tail, Moffat. *Dr. Nichol*. Berwickshire ! *Sir W. C. Trevelyan*.

IRELAND :—Common. *Mr. Carroll*. Benbulbin ! co. Sligo. *Dr. Moore*. Collin Glen ! Belfast. *Dr. Dickie*. Killarney. *Dr. Carrington*.

WALES :—Garn Dingle, Denbighshire. *Mr. Griffith*. The Torrent Walk, Dolgelley ! *Mr. Lees*. Dollymellyn ; Garth Isaf, Merionethshire. *Mr. Borrer*.

CHANNEL ISLANDS :—Quenvais, Jersey ! *Mr. Lorbalestier*. Guernsey. *Rev. T. Salwey*.

Var. *puleinatum*, (Hffm.) dark brown, smaller, pulvinate, lobes minute, much crowded, denticulato-laciniate.

On mossy rocks, &c., not common.

SYN :—Hffm. Fl. Germ. 2. 1104. (1795).

EXS :—Schaer. 406. M. & N. 637. Larbal. 55. Hepp 929.

GEOG. DISTRIB :—Scandinavia, Germany, Switzerland.

BOT. PROV :—5.. 7, 8...11...16...28.. 30, 31.

ENGLAND :—Shropshire ! *Rev. T. Salwey*. White Ladies, Aston ! and near Warndon ! Worcester. *Dr. Holl*. Twycross ! Leicestershire. *Rev. A. Bloom*. Teesdale. *Mr. Robertson*. Malvern Hills and near Ankerdine, Worcestershire. *Dr. Holl*.

SCOTLAND :—Appin. *Rev. J. M. Crombie*.

IRELAND :—Ariagh. *Adm. Jones*. Killarney. *Mr. Carroll*. Deer Park, Belfast ! *Prof. Dickie*.

WALES :—Dolgelley. *Dr. Holl*.

CHANNEL ISLANDS :—Quenvais, Jersey ; Herm ! *Mr. Lorbalestier*.

Var. *lophaeum*, Ach. thallus still smaller, elongated, ciliato-dissected or ramoso fimbriate, sterile.

On mossy rocks &c., rare.

SYN :—Ach. L. U. 651. (1810) ; Syn. 324. Nyl. Syn. 122.

EXS :—Anzi Langob. 412. a.

GEOG. DISTRIB :—Italy, Russia.

BOT. PROV :—5...16.

ENGLAND :—Near Malvern. *Dr. Holl.*

SCOTLAND :—Appin. *Rev. J. M. Crombie.*

14. *L. sinuatum*, (Huds.) *plumbeo-fuscescent*, *rotundato-lobate*, *reticulato-rugulose*, lobes crowded, rounded, imbricate, margin entire or crenate, suberect ; apothecia brown, scattered, minute, sessile, concave, margin smooth, entire, elevated ; spores 8, colourless, oblong, attenuated at the apices, irregularly murali-ocular.

On old mossy walls, rare. 1741.

SYN :—Huds. Fl. Angl. 535. (1778) ; *Collema scotinum* Ach. Syn. 323. Nyl. Syn. 123. Scand. 34.

FIG :—E. Bot. t. 772. Hepp Sporen t. 74. f. 653.

EXS :—Nyl. 101. M. & N. 1332. Mudd 6. Schær. 405. Hepp 653. Zw. 171.

GEOG. DISTRIB :—Europe, Scandinavia, Sweden, Finland, Austria. Germany, Algeria, N. Zealand.

BOT. PROV :—1.. 4, 5...7, 8.. 11...14, 15, 16 ..19, 20,...28...30.

ENGLAND :—Near Wigmore, Herefordshire. *Mr. Littleton Brown.* (1741). Ashburton, Devon. *Mr. Hudson.* Chagford, Devon. *Mr. Newberry.* Burgh Castle, near Yarmouth. *Mr. D. Turner.* Stanhope, Durham. *Mr. Mudd.* near High Force Inn, Teesdale. *Dr. Holl.* Pentregaer, near Oswestry ! *Rev. T. Salwey.* Chance's Rocks, Malvern Hills ! *Mr. Lees.* Matlock ! Derbyshire. *Prof. C. Babington.* near Buxton, and Hales End ! Worcester. *Dr. Holl.* Budleigh Salterton. *Prof. Dickie.* Hassock's Gate, Sussex. *Mr. Larbalestier.*

SCOTLAND :—Appin ; Lochaber. *Rev. J. M. Crombie.* near Aberdeen ! *Dr. Dickie.* Gare Loch ! Dunbar. *Prof. Ch. Babington.* Ben Lawers. *Dr. Holl.*

IRELAND :—Armagh. *Adm. Jones.* Belfast. *Mr. Templeton.* Bantry. *Miss Hutchins.* Dunkerron. *Dr. Taylor.* Cork. *Mr. Carroll.*

WALES :—Garn, Denbighshire. *Mr. Griffiths.* Barmouth !

15. *L. palmatum*, (Huds.) *fuscescent*, *fusco-cinerascent* or *fusco-glaucouscent*, thin, membranous, *laciniate*, laciniae erect, sublinear, *corniculato-convolute* ; apothecia rufescent, small, sessile, irregularly scattered, concave, margin elevated, entire ; spores 8, colourless, ellipsoid, attenuated at the apices, irregularly murali-ocular.

On mossy sandy ground, rare. 1696.

SYN :—Huds. Fl. Ang. 536. (1778) ; Ach. Syn. 319. Nyl. Syn. 126. Scand. 35.

FIG :—E. Bot. t. 1635.

Exs :—M. & N. 1058. Hepp 921.

GEOG. DISTRIB :—Central Europe, France, Germany, Switzerland, Sweden, Algeria, Canaries.

BOT. PROV :—2, 3, 4...10...15...22...28...31.

ENGLAND :—Yarmouth; Hemsly. *Mr. D. Turner*. Coatham ! Cleveland. *Mr. Mudd*. Cobham, Surrey; Barrow Hill, Henfield. *Mr. Borrer*.

SCOTLAND :—Braemar ! *Prof. Churchill Babington*. Sands of Barrie. *Adm. Jones*.

IRELAND :—Luggelaw, co. Wicklow. *Dr. Moore*. Armagh. *Adm. Jones*.

CHANNEL ISLANDS :—Guernsey ! *Mrs. Collings*. Herm. *Mr. Laroche*.

16. *L. tenuissimum*, (Dicks.) *fusco-virescent*, imbricated, *microphylline*, *digitato-multifid*, *laciniæ linear*, unequal, subciliate; *apothecia* biatorine, *urceolate*, *margin entire*, thick, *paler*; spores 8, colourless, ovoid or oblong, irregularly murali-ocular.

On mossy earth, not common. 1782.

SYN :—Dicks. Br. Crypt. 1. 12. (1785); Nyl. Scand. 33.

FIG :—Dicks. l. c. t. 2. f. 8. E. Bot. t. 1427. Nyl. Syn. t. 4. f. 10.

Exs :—Schær. 408. Hepp 211. Mudd 4.

GEOG. DISTRIB :—France, Sweden, Finland, Germany.

BOT. PROV :—1, 2...4...7...10...15...19...28.

ENGLAND :—Norwich. *Mr. Crowe*. (1782). Ditchingham, Norfolk. *Mr. Woodward*. near Yarmouth. *Mr. D. Turner*. near Easby ! Cleveland. *Mr. Mudd*. Sidmouth. *Rev. T. Salway*. Twineham, Sussex. *Mr. Borrer*. near Hastings; and Shanklin, Isle of Wight. *Dr. Holl*. Inworth, Essex. *Mr. Varenne*.

SCOTLAND :—Forfarshire. *Mr. W. Gardiner*.

IRELAND :—Middleton, near Cork. *Mr. Carroll*. Armagh. *Adm. Jones*.

WALES :—Crib-y-Ddescil, and Clogwyn-y-Garnedd, Snowdon. *Mr. Griffith*. Glyder Vach. *Mr. Lees*.

17. *L. rhyparodes*, Nyl. *fuscous* or *fusco-nigrescent*, *furfuraceous*, thin, or subgranulose, diffuse, vinous-red with iodine; *apothecia* concolorous or rarely rufescent, small, somewhat plane and eventually *biatorine*; spores 8, colourless, ovoid, one or both apices attenuate, sub-murali-divided; paraphyses slender; gelatina hymenea blue with iodine.

On alpine rocks, rare. 1864.

SYN :—Nyl. in Flora, 1857. p. 210. Carroll in Seem. Journ. Bot. 3. 287.

BOT. PROV :—15

SCOTLAND :—Near summit of Ben Lawers ! *Adm. Jones*. (1864).

18. *L. fragile*, (Tayl.) *dark-olive or fusco-olivaceous*, firm, *laciniato-lobate*, *rosulate*, lobes *radiate*, *crenate*, *convex*, *granuloso-unequal*; granula gonima variously dispersed, rarely moniliform; *apothecia* pale brown, *urceolato-innate*, at length nearly plane, thalline margin thickish; spores 8, colourless, ovoid, variously divided.

On sub-alpine calcareous rocks, very rare.

SYN:—*Collema*, Tayl. Fl. Hib. 2. 109; *Leptogium*, Nyl. Syn. 120.  
 EXS:—Arn. 156.

BOT. PROV:—19.

IRELAND:—Dunkerron. *Dr. Taylor*.

19. *L. Schraderi*, (Bernh.) *darkish olive-green*, *cæspitose*, small, erect, *dichotomously branched*, lobes *sublinear*, irregularly *undulato-sulcato-rugose* and angular, *constricted at the base and apices*, *dilated in the middle*; *apothecia* reddish, lateral, concave, margin entire, paler.

Among mosses in calcareous soil, rare. 1783.

SYN:—Bernh. in Schrad. Journ. 1799. fasc. 1. 22. Ach. Syn. 328. Nyl. Syn. 133

FIG:—E. Bot. t. 2284.

GEOG. DISTRIB:—France, Germany, Bavaria, Algeria.

BOT. PROV:—1, 2, 4, 5, 8, 19, 28.

ENGLAND:—Matlock, Derbyshire. *Sir J. E. Smith*, (1783). Caistor Church, Norfolk; and near Bury; and Sussex. *Mr. D. Turner*, near Yarmouth; Bath. *Rev. J. M. Crebble*, Holy Bush Hill, Malvern. *Dr. Holl*, near Storrington Church; Crow Link, Sussex. *Mr. Borrer*, Sussex Downs, near Brighton; near Bath; near Babbicombe, S. Devon; Shanklin, Isle of Wight. *Dr. Holl*, L'etaq. Jersey; Herm. *Mr. Larbalestier*,

IRELAND:—Killarney. *Dr. Moore*, near Cork. *Mr. Carroll*, Sheep Walk, Armagh, *Adm. Jones*.

CHANNEL ISLANDS:—L'etaq. Jersey; Herm. *Mr. Larbalestier*.

## V. PYRENIDIUM *Nyl.*

Thallus minute, stellato-divided or cæspitellose or confluendo-effuse, of the same structure as that of *Leptogium*. Apothecia pyrenocarpons verrucarioid.

1. *P. actinellum*, Nyl. dark olivaceous, adnate, forming small patches, stellato-divided, rays distinct, attenuated at their apices, ascending or suberect, vinous-red with iodine; apothecia pyrenodeous, in the centre of the thallus, prominent, perithecium entirely black; spores



4, fuscous or fuscescent, oblong, 3-septate ; paraphyses few, slender or obsolete.

On chalk, very rare. 1865.

SYN :—Nyl. in Flora, 1865, p. 210.

BOT. PROV :—3.

ENGLAND :—Boxley Hill, Kent. *Adm. Jones.* (1865).

## FAM : II. MYRIANGIACEI.

### TRIBE I. MYRIANGIEI.

#### I. MYRIANGIUM. *Mnt. & Berk.*

Thallus black, noduloso-pulvinate, cellulose, unstratified. Apothecia sublecanorine, sphæroideo-cellulose. Spores 8, colourless, oblong, irregularly septate, or almost murali-divided.

1. *M. Duriei*, M. & B. black, opaque, small, tuberculato-glomerate or noduloso-confluent, often depresso-pulvinate ; apothecia minute, black, slightly impressed ; spores 8, colourless, oblong or oblongo-ovoid, variously septate ; gelatina hymenea vinous with iodine.

On ash and elm, rare. 1836.

SYN :—Mnt. and Berk. in Hook. Journ. Bot. 1845. p. 73. Ny.. Syn. 139. *Collema glomerulosum*, Tayl. Fl. Hib. 2. 108. excl. synl

FIG :—Nyl. Syn. t. 4. f. 1, 5.

EXS :—Mass. 37.

GEOG. DISTRIB :—Europe, France, Algeria, Mexico, Australia. N. America.

BOT. PROV :—1, 2...19...31.

ENGLAND :—Penzance. *Mr. Ralfs.* Isle of Wight. *Rev. T. Salwey.* near Shanklin. *Dr. Holl.*

IRELAND :—Carrigaline ! near Cork ; near Crosshaven, Cork. *Mr. Carroll.* Roughty, Kerry. *Dr. Taylor.* (1836).

CHANNEL ISLANDS :—Sark ! *Rev. T. Salwey.*

## FAM : III. LICHENACEI.

Thallus various in colour, white, whitish, cinerascens, flavicant, rufous, fuscous, and very rarely nigricant, and very various in form, filamentous, foliaceous, squamose, crustaceous, pulverulent or evanescent. In most species the stratum gonidiale formed of true gonidia, in a few only of granula gonima. Apothecia either stipitate or lecanorine or peltate, or patellulate, or pyrenocarpous.

## SERIES 1. EPICONIODEI.

Apothecia with the spores naked, collected into a sporal mass on the surface. Spores 8, in asci.

## TRIBE I. CALICIOEI.

Thallus crustaceous or obsolete, yellow or flavo-virescent or cinerascens or whitish. Apothecia cupuliform, constricted below into a stipes or sessile.

I. SPHINCTRINA. *Fr. pr. p. D.N.*

Thallus none. Apothecia parasitic on *Pertusariæ*, globoso-turbinate, shining, black. Spores nigrescent, simple.

1. *S. turbinata*, (Pers.) apothecia *subsessile*, small; spores *small, globose* or *subglobose*; iodine pale blue, then obscured.

On *Pertusaria communis*, common. 1796.

SYN :—*Calicium turbinatum*, Pers. Fung. 59. Ach. Syn. 56. Nyl. Syn. 142.

FIG :—E. Bot. 2520. Nyl. Syn. Lich. t. 5. f. 1.

EXS :—Schær. 6. Leight. 132. Mudd. 241. Anz. Ital. S. 46.

GEOG. DISTRIB :—Europe. Scandinavia, Portugal, France, Algeria, N. America.

BOT. PROV :—5...10.. 15 . 19.

ENGLAND :—Near Guisbro! Easby! Yorkshire. *Mr. Mudd*. Po-wick, Worcestershire. *Mr. Lees*. near Oswestry, Shropshire. *Rev. T. Salwey*. Aymestrey! Hey Forest! Herefordshire; Shropshire!

SCOTLAND :—Northern parts. *Rev. J. M. Crombie*. Carse of Gowrie. *Mr. Bousie*.

IRELAND :—Blarney, Cork! *Mr. Carroll*.

CHANNEL ISLANDS :—Rozel, Jersey. *Mr. Lorbalestier*.

2. *S. anglica*, Nyl. apothecia *substipitate*, on grey thallus; spores *globose, ellipsoid and oblong, moderate*, iodine blue.

On old rails &c., rare. 1805.

SYN :—Nyl. Syn. Lich. 143. *Calicium microcephalum*, Sm. T. and B. Lich. 130.

FIG :—E. Bot. 1865. Nyl. Syn. t. 5. f. 3.

EXS :—Korb. 203. Rab. 562. Arn. 245. Zw. 285. Th. M. Fr. 72.

GEOG. DISTRIB :—N. England, N. America.

BOT. PROV :—2 4, 5 ..8...20.

ENGLAND :—Albourne ! Sussex ; Caistor, near Yarmouth. *Mr. Borrer*. (1805). Packington. *Countess of Aylesford*. Twycross ! Gopsall ! Leicestershire. *Rev. A. Bloxam*.

IRELAND :—Curraghmore, near Waterford. *Adm. Jones*.

3. *S. microcephala*, Nyl. apothecia sessile, fuscous ; spores nigricant, fusiformi-ellipsoid, simple, large.

On Pertusariæ, rare. 1869.

SYN :—*S. microcephala*, Nyl. Calic. 6. Nyl. Syn. 144.

FIG :—Tul. Mem. Lich. t. 15. f. 20. Nyl. Syn. t. 5. f. 2.

EXS :—Nyl. 5. Hepp 551.

GEOG. DISTRIB :—Europe, France, Pyrenees, Ceylon, Madeira.

BOT. PROV :—2.

ENGLAND :—New Forest, Hants. *Rev. J. M. Crombie*. (1869).

CHANNEL ISLANDS :—Rozel, Jersey. *Mr. Iarbalcestier*.

## II. CALICIUM. *Ach. Nyl.*

Thallus granulose, powdery, squamulose or altogether evanescent. Apothecia black, stipitate or sub-sessile, capitula globose or turbinate or cupular. Spores fuscous or nigricant. Spermatia short, oblong.

### A. Spores simple.

1. *C. diploellum*, Nyl. obsolete ; apothecia black very shortly stipitate, capitulum turbinate, open, sporal mass scarcely prominent ; spores nigrescent, oblong, simple (or 1-septate.)

On holly, very rare. 1868.

The smallest of all the species, and easily recognized. Its place is near *disseminatum*.

SYN :—*C. diploellum*, Nyl. in Flora, 1868. p. 1861.

BOT. PROV :—19.

IRELAND :—Cromaglow, Killarney. *Mr. Carroll*. (1868).

2. *C. chrysocephalum*, *Ach. citrine or yellow-green, granulate, verrucoso-conglomerate* or evanescent ; apothecia black, shortly stipitate or elongated, capitula turbinate-lentiform, citrino-suffused beneath and at margin ; sporal mass amber or ferruginous ; spores fuscous, globose.

On palings &c., rare. 1804.

SYN :—*C. chrysocephalum*, *Ach. Meth. Suppl.* 15. Syn. 60. Nyl. Syn. 146.

FIG :—E Bot. 2501. Nyl. Syn. Lich. t. 5. f. 11, 12, 12.

EXS :—Schær. 12. Nyl. 10. Hepp 329. Leight 134. Mudd. 251  
GEOG. DISTRIB :—Europe, N. America.

BOT. PROV :—3, 4, 5...10..14.

ENGLAND :—Sotterley, Suffolk. *Mr. D. Turner*. (1804). Norfolk ; Suffolk ; Essex. *Sir W. J. Hooker*. Rosedale, and Baysdale, Cleveland, Yorkshire ! *Mr. Mudd*. Downton Castle ! Herefordshire.

SCOTLAND :—Near Slateford. *Dr. Greville*.

*f. melanocephalum*, Nyl. (Leight. Exs. 134.) apothecia fasciculato-ramose, stipes black, capitula black, citrino-suffused at margin only ; spores globose or ellipsoid, pale-fuscos, larger.

Downton Castle ! Herefordshire, on the same palings with common form.

3. *C. phæocephalum*, Borr. *pallido-cinerascent* or *darkly flavicant*, minutely *granuloso-squamuliform*, crenate, congested ; apothecia with slender black or fuscous stipites, capitula *turbinato-lentiform*, *flavo-viridi-pruinose*, sporal mass *fuscous* ; spores fuscuscent, globose.

On boards, palings, &c., rare. 1807.

SYN :—*C. phæocephalum*, T. & B. Lich. Brit. 145. Ach. Syn. 61. Nyl. Syn. 147.

FIG :—E. Bot. 1540. Nyl. Syn. t. 5. f. 13.

EXS :—Schær. 245. Rab. 592. Korb. 260. Zw. 242. A. B. C.

GEOG. DISTRIB :—Scandinavia, Germany, Helvetia, N. America.

BOT. PROV :—2...4, 5.

ENGLAND :—Lakenham, near Norwich. *Mr. D. Turner*. (1807). Hurstpierpoint, Sussex ! *Mr. Borrer*. Bruisyard, Suffolk ; Albourn, Sussex. *Sir W. J. Hooker*. Hay Park near Ludlow. *Rev. T. Salwey*. Cookhill Wood, Worcestershire. *Mr. Purton*.

4. *C. aciculare*, (Sm.) *cinerascent*, very thin or obsolete ; apothecia with *obconico-turbinate capitula flavo-viridi-suffused*, sporal mass *brown*, much protruded ; spores fuscuscent, globose.

On oaks, firs, hollies, &c., rare. 1812.

SYN :—*Lichen acicularis*, Sm. E. Bot. 2385. Nyl. Syn. 148.

FIG :—E. Bot. 2385. Nyl. Syn. t. 5. f. 14.

EXS :—Zw. 19. Leight. 170. Hepp 328. Nyl. 9. Mudd 252.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2, 3.. 16...24.

ENGLAND :—Near Bury. *Rev. G. R. Leathes*. (1812), Sussex ! *Mr. W. Borrer*, Brantsdale ! Newton Wood, and Bousdale Gill ! Yorkshire. *Mr. Mudd*. Esher, Surrey ; Hurstpierpoint, Sussex. *Sir W. J. Hooker*.

IRELAND :—Tervoe, near Limerick ! *Mr. Carroll*.

5. *C. trichiale*, Ach. flavido-cinerascent or cinereo-glaucous, minutely granuloso-squamulose; apothecia black, stipes slender, capitula black, globoso-lenticular, cinereo-suffused beneath, sporal mass umber, convex or hemispherical; spores fuscous, spherical, minute.

On trees, timber, &c., rare.

SYN:—*C. trichiale*, Ach. L. U. 243. Syn. 62. Nyl. Syn. 149.

FIG:—V. Ak. H. 1816. t. 8. f. 14. Nyl. Syn. t. 5. f. 16.

EXS:—Schær. 10, 11. Rab. 591.

GEOG. DISTRIB:—N. Europe, N. America.

BOT. PROV:—5...10...14.

ENGLAND:—Near Ludlow, Shropshire. Rev. T. Salwey. Ingleby, Cleveland. Mr. Mudd.

SCOTLAND:—Binnie Woods, Haddingtonshire. Dr. Maingay.

Var. *cinereum*, (Pers.) cinerascens or albido-granulose, stipites and capitula cinereo-suffused.

On old pines and oaks.

SYN:—*Calicium cinereum*, Pers. Icon. and Descr. Fung. p. 38. Ach. Syn. 57. Nyl. Syn. 149.

FIG:—Pers. Icon. and Descr. Fung. t. 14.

EXS:—Schær. 452.

GEOG. DISTRIB:—Germany, Helvetia, France, Scandinavia, Finland.

BOT. PROV:—20..24.

IRELAND:—Deer Park, Castlemartyr, co. Cork; Tervoe, near Limerick. Mr. Carroll.

Var. *stemoneum*, Ach. yellow or flavido-cinerascent, leproso-granulate; apothecia black or fuscous-black, capitula cinereo-pruinose or nearly naked beneath.

On trees.

SYN:—*C. stemoneum*, Ach. L. U. 243. Syn. 62. Nyl. Syn. 150.

FIG:—E. Bot. 2502. Nyl. Syn. t. 5. f. 15.

EXS:—Nyl. 12. M. & N. 956. Schær. 13. 249. Zw. 12. 17. Hepp 158. Rab. 513. Leight. 227. Mudd 248.

GEOG. DISTRIB:—Europe.

BOT. PROV:—2...4...10.

ENGLAND:—Cuckfield, Sussex! Mr. Borrer. Bousdale Gill. Newton Wood, and near Ingleby, Cleveland, Yorkshire. Mr. Mudd. near Bury St. Edmunds, Suffolk. Rev. G. R. Leathes.

Var. *ferrugineum*, (Borr.) pale-cinerascent, conglomerato-granulose or leproso; apothecia large, sessile; spores pale-fuscous, large.

On oaks, pales, &c. 1839.

SYN:—*C. ferrugineum*, T. & B. Lich. Br. 156. Nyl. Syn. 150.

FIG:—E. Bot. 2473. Nyl. Syn. t. 5. f. 16.

EXS:—Mudd 249. Leight. 315.



GEOG. DISTRIB :—Germany, France.

BOT. PROV:—3, 4, 5...10.

ENGLAND :—Framlingham, near Norwich. *Mr. D. Turner.* (1839). Moor Park and Hay Park, near Ludlow. *Rev. T. Salwey.* Thorndon Hall Park! *Mr. Piggot.* Little Malvern, co. Worcester. *Mr. Lees.* Hoggarts Wood; Ingleby; Greenhow, Yorkshire! *Mr. Mudd.* Bury St. Edmunds, Suffolk. *Rev. G. R. Leathes.* Ragley Park, Rufford, Worcestershire. *Mr. Purton.* Almond Park! near Shrewsbury; Caer Caradoc! Shropshire.

Var. *brunneolum*, (Ach.) evanescent; stipes slender, longate, capitulum small; spores sphaerical, minute.

On old trees, &c.

SYN:—*C. brunneolum*, Ach. in V. A. H. 1816. p. 279. Nyl. Syn. 151.

FIG :—V. Ak. H. 1816. t. 8. fig. 12. Nyl. Syn. t. 5. f. 16.

EXS :—M. & N. 1068. Schar. 9. Zw. 17. Leight. 252. Mudd 250. Fellm. 12.

GEOG. DISTRIB :—Europe, N. America.

BOT. PROV :—10.

ENGLAND :—Busby Hall; Ingleby Park; Baysdale, Stogdale, Yorkshire! *Mr. Mudd.*

6. *C. melanophycum*, Ach. *whitish, granulose*; stipes *strong, black, naked*, capitula black, *turbinate*, sporal mass *umber*; spores *fuscescent, globose, moderate*.

On firs, &c., rare.

SYN :—*C. melanophycum*, Ach. in Ak. H. 1816. p. 276. Nyl. Syn. 151.

FIG :—V. Ak. H. 1816. t. 8. f. 8. Nyl. Syn. t. 5. f. 17.

EXS :—Schar. 638. Zw. 16. Nyl. 11. Anzi lt. S. 38. Anzi Ven. 116.

GEOG. DISTRIB :—Scandinavia, Germany, Helvetia, France, N. America.

BOT. PROV :—2, 3...10, 11...15.

ENGLAND :—Eglestone, Durham, *Rev. J. Harriman.* Hoggarts Wood and Lounsdale, Cleveland, Yorkshire. *Mr. Mudd.* Sussex! *Mr. Borrer.* Thorndon Hall Park! Essex. *Mr. H. Piggot.* Epping Forest. *Rev. J. M. Crombie.*

SCOTLAND :—Near Stirling and Aberfeldy. *Rev. J. M. Crombie.*

*C. trichiale* var. *ferrugineum* should be compared with this. Are they not both states of the same plant?

### B. Spores 1-septate.

#### \* *Corticolaë.*

7. *C. hyperellum*, Ach. *flavo-virescent, granulose or subleprose*; apothecia black, capitulum *globoso-lentiform*, *stipes black, elongate*. sporal mass black or umber-black; spores *nigrescent, ellipsoid, 1-septate, small*.

On oaks, alder, limes, &c. very common. 1783.

SYN:—*C. hyperellum*, Ach. Meth. p. 93. Nyl. Syn. 152.

FIG:—E. Bot. 1832. Nyl. Syn. t. 5. f. 23.

EXS:—M. & N. 1069. Schær. 241. 242. Leight. 23. Hepp 333. Arn. 105. Mudd 245.

GEOG. DISTRIB:—Europe, Scandinavia, N. America.

BOT. PROV:—4, 5, 7, 8...10...15 . 19...30.

ENGLAND:—Earsham, Norfolk. *Sir J. E. Smith*. near Bury, Suffolk. *Mr. D. Turner*. Kildale and Baysdale, and Brantsdale, Cleveland, Yorkshire. *Mr. Mudd*. Ashe, Norfolk; Ditcheling, and Herringfleet, Sussex! *Mr. Borrer*. Ickworth, Suffolk. *Sir T. Grev*. Pophills; Rufford; Warwickshire. *Mr. Purton*. Shropshire, ! Herefordshire! Leicestershire. !

SCOTLAND:—rarely. *Rev. J. M. Crombie*.

IRELAND:—Near Belfast. *Mr. Templeton*. Killarney. *Sir T. Gage*.

WALES:—Near Bala! *Mr. Brittain*.

8. *C. trachelium*, Ach. cinerascens, thin, granulose or obsolete; apothecia black, capitulum turbinato-globose, rufescent beneath; spores nigricant, ellipsoid, 1-septate, constricted, large.

On trees, pales, &c., not common. 1778.

SYN:—*Calicium trachelium*, Ach. in V. Ak. II. 1816. p. 272. Nyl. Syn. 154.

FIG:—E. Bot. 414. Nyl. Syn. t. 5. f. 24.

EXS:—Zw. 15. Hepp 100. Nyl. 16. M. & N. 475. d. Schær. 243. Fellm. 15. Leight. 270. Mudd 246.

GEOG. DISTRIB:—Europe, N. America, Peru.

BOT. PROV:—2.. 4, 5...10, 11, 12...14.. 19...22...30, 31.

ENGLAND:—Norfolk. *Sir W. J. Hooker*. near Bury, Suffolk. *Rev. G. R. Leathes*. Hexham, near Eglestone. *Mr. Winch*. Twineham, Sussex. *Mr. Borrer*. North of England. *Rev. John Harriman*. Sibthall House. *Dr. G. Johnstone*. near Stokesley, Kildale, Baysdale, Ingleby, Oggeray Hill, Newton Wood, Cleveland, Yorkshire! *Mr. Mudd*. Cumberland. *Mrs. J. Stanger*. Oswestry, Shropshire. *Rev. T. Salwen*. Pophills; Rufford, Warwickshire. *Mr. Purton*. Hay Park, near Ludlow! Shropshire.

SCOTLAND:—Rosslyn Woods. *Mr. G. Doa*.

IRELAND:—Powercourt. *Dr. Whitley Stokes*. Glenarm. *Dr. Moore*. Castlebernard Park, Bandon. *Mr. J. Sullivan*.

CHANNEL ISLANDS:—Noirmont Bay, Jersey. *Mr. Larbales tier*.

9. *C. quercinum*, Pers. greyish white, granulose, or nearly smooth, or subleprose or evanescent; apothecia black, moderate, capitulum turbinato-lentiform, cinereo-pruinose beneath; disk plano-convex, white, pruinose or naked, with grey margin; spores nigricant, ellipsoid,

1-septate, slightly constricted, *small*.

On oaks, wood, &c. 1805.

SYN:—*C. quercinum*, Pers. Fung. Suppl. 59. Nyl. Syn. 155.

FIG:—E. Bot. 1465. Nyl. Syn. t. 5, f. 25.

EXS:—Nyl. 14. M. & N. 473, Schær. 247, 505, Zw. 98. Mudd 244.

GEOG. DISTRIB:—Europe, N. America.

BOT. PROV:—2...4, 5...10...14.

ENGLAND:—Lakenham, Suffolk. *Mr. Borrer*. (1805.) Ayton, Stokesley, Baysdale, Newton Wood, Yorkshire. *Mr. Mudd*. Studley Park, Yorkshire. *Mr. Bruntton*. near Thirsk. *Mr. J. G. Baker*. Pembridge, Herefordshire. *Rev. J. F. Crouch*, near Brockenhurst in New Forest. *Rev. J. M. Crombie*. Hexham; Eglestone. *Mr. Winch*.

SCOTLAND:—Auchindenny. *Dr. Greville*.

10. *C. curtum*, Borr. *cinerascens*, *thin or obsolete*; apothecia *strong*, capitulum *turbinato-cylindrical*, margin *albo-suffused*, sporal mass *black*, *protruded*; spores *nigricant*, ellipsoid, 1-septate.

On wood, pales, &c. common. 1813.

SYN:—*C. curtum*. T. & B. Lich. Br. p 148, Nyl. Syn. 156.

*C. sphærocephalum* var. *abietinum*. Ach. Syn. 58.

FIG:—E. Bot. 2503.

EXS:—Zw. 186 & 20. Leight. 133. Hepp 337. Schær. 248, M. and N. 1237. and 957. Mudd 243. Fellm. 16. Anzi Langob. 345.

GEOG. DISTRIB:—Europe, Scandinavia, Kamtschatka, N. America, N. Zealand.

BOT. PROV:—1. 2...5...7...10.

ENGLAND:—Stokesley, Ayton, Newton, Stogdale, Cleveland! *Mr. Mudd*. Gopsall Park, Leicestershire! *Rev. A. Bloxam*. Sussex! *Mr. Borrer*. (1813); Hallow, near Worcester. *Mr. E. Lees*. Bath-easton! *Mr. Broome*. Oswestry, Salop! *Rev. T. Salwey*. Abdon!; High Rock, near Bridgnorth!; Haughmond Hill!; Loppington!; Hay Park, near Ludlow! Shropshire.

IRELAND:—Deer Park, Castlemartyr, co. Cork! *Mr. Carroll*.

WALES:—Bala! *Mr. Brittain*.

11. *C. subtile*, (Pers.) *greyish-white*, *thin*, *filmy*; apothecia *minute*, stipes *short*, *slender*, black, capitula *minute*, *subglobose*, or *turbinato-lentiform*, disk slightly *convex*, brownish-black; spores *fuscescent*, oblong, or ellipsoid, 1-septate.

On dead trees, timber, &c., rare. 1812.

SYN:—*C. subtile*. Pers. Fung. Suppl. 60. Mudd Man. 259.

FIG:—E. Bot. 2462.

EXS:—Nyl. 13. Hepp 338. Leight. 314. Mudd 247.

GEOG. DISTRIB :—Europe, Germany, France, Scandinavia, N. America.

BOT. PROV :—10...14.

ENGLAND :—Blackbeck, Baysdale, Cleveland, Yorkshire! *Mr. Mudd.* Sussex! *Mr. Borrer.* (1812.) Cawsey Wood, Durham. *Mr. Winch.*

SCOTLAND :—Auchindenny Woods. *Dr. Greville.*

12. *C. populneum*, (De Brond.) *macular*, pale or whitish; apothecia *entirely black*, slight, somewhat shining, stipes slender, capitulum *turbinate*; spores nigrescent, ellipsoid, *simple, obsolete, bilocular, large.*

On poplars, rare. 1813.

SYN :—*C. populneum*, *De Brondeau* in Dub. B. Gall. 638. Nyl. Syn. 159.

EXS :—Hepp 339. Zw. 287. Arn. 60. Anzi Langob. 424.

GEOG. DISTRIB :—W. France.

BOT. PROV :—19.

IRELAND :—Killarney. *Sir. T. Gage.* (1813.)

13. *C. retinens*, Nyl. white, opaque, thin, subfarinaceous, effuse; apothecia black, minute, sessile, lecideiform, sporal mass indistinct; spores nigrescent, oblong, or oblongo-cylindrical, conspicuously 1-septate; hypothecium rubricosofuscescent.

On oak. 1868.

SYN :—*C. retinens*, Nyl. in Flora, 1868, p. 161.

BOT. PROV :—31.

CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.* (1868.)

## \*\* *Saxicolæ.*

14. *C. citrinum*, (Leight.) parasitic on thallus of *Lecidea lucida*; stipes short and stout or elongated, *rusty-brown, flavo-pulverulent*, capitulum *globose*, sporal mass yellowish brown; spores *minute*, linear-oblong, *simple*, or *uniseptate*, fuscous.

On the under surface of stones in walls. 1856.

SYN :—*Coniocybe citrina*, Leight. Ann. & Mag. N. H. 1857. p. 180. Nyl. Syn. 149.

FIG :—Ann. and Mag. N. Hist. t. 8. f. 9. Nyl. Syn. t. 7. f. 1.

EXS :—Leight. 269. Zw. 286. Rab. 787.

GEOG. DISTRIB :—Saxony.

BOT. PROV :—7.

WALES :—Between Corwen and Bala! (1856).

## *C. Spores 3-septate.*

15. *C. septatum*, (Leight.) obsolete; apothecia brownish-black, stipes short, stout and smooth, capitu-

lum clavato-pyriform, truncate, incurved at the margin ; disk depressed, dark brown ; spores 8, *very large, elliptical, 3-septate, umber-coloured*, cells granular.

Parasitic on thallus of *Thelotrema lepadinum* and on holly. 1856.

SYN:—*Sphinctrina septata*, Leight. in Ann. and Mag. N. Hist. 1857. p. 132. *C. eusporum*, Nyl. Syn. 160.

FIG:—Ann. and Mag. N. Hist. 1857. t. 8. f. 20. 24. Nyl. Syn. t. 5. f. 28.

EXS:—Zw. 21. Leight. 228. Arn. 152. Mudd 242.

GEOG. DISTRIB:—Bavaria, France.

BOT. PROV:—2...10...19.

ENGLAND:—Ingleby Park, Brantsdale, Farndale, Bousgale Gill, Hoggarts Wood, Cleveland, Yorkshire! *Mr. Mudd*. (1859). New Forest. *Rev. J. M. Crombie*.

IRELAND:—Near Killarney and Old Deer Park, Castlemartyr, co Cork ; Glenbower, Killeagh. *Mr. Carroll*.

16, *C. trajectum*, Nyl. thin, pale-greenish-white, indeterminate; apothecia very small, polished, black, stipes erect, or flexuose, short, stout, capitulum extremely small, highly polished, immarginate ; spores oblongo-fusiform, bilocular (or 4-locular.)

On holly. 1863.

SYN:—*C. trajectum*, Nyl. in Flora 1865. p. 211. Edin. Bot. Soc. Trans. 7. p. 557. (1863).

BOT. PROV:—2.

ENGLAND:—New Forest, Hampshire. *Rev. T. Salwey*. (1863).

### III. CONIOCYBE. *Ach. Nyl.*

Thallus leprose or powdery, effuse or evanescent. Apothecia yellow or pale (not black,) stipitate, excipulum very open. Spores spherical, colourless or flavescent, forming the globoso-pulverulent capitulum.

1. *C. furfuracea*, Ach. sulphureous or sulphureo-virescent, apothecia sulphureo-suffused, or with flavo-virescent, naked, elongate stipites, sporae mass yellow or pale umber ; spores colourless or pale fuscous, spherical, minute.

On roots of trees and sandy ground, not common. 1805.

SYN:—*C. furfuracea*, Ach. in V. Ak. H. 1816, p. 288.

FIG:—E. Bot. 1539. Ann. & Mag. N. H. 1857, t. 8, f. 14. Nyl. Syn. t. 5, f. 37.



EXS:—Schær. 14, M. & N. 1238. Leight. 225, Anzi Ital. S. 35, Hepp 758.

GEOG. DISTRIB:—Europe, Switzerland, Italy, Germany, Lapland, N. America.

BOT. PROV:—2, 3, 4, 5...10, 11, 12...14, 15...30.

ENGLAND:—Near Bury, Suffolk. *Rev. G. R. Leathes*. (1805.) Dorking and Esher, Surrey; near Halesworth, Suffolk; Shanklin, Isle of Wight; Henfield, Sussex! *Mr. Borrer*. Cumberland! *Mrs. Stanger*. Red Wood, Cotteswold, near Cheltenham. *Mr. Lees*. Oswestry; Ludlow, Shropshire. *Rev. T. Salwey*. Brantsdale, Yorkshire. *Mr. Mudl.* near Gateshead. Durham. *Mr. Robertson*. Bartley Lodge, New Forest. *Mr. Lyell*. Cow Close, near Ravensworth, and Long Acre Wood, Durham; Felton Wood; Wansbeck; Wallington; Northumberland. *Mr. Winch*. near Stourbridge, Worcestershire, *Mr. Scott*. High Rock! near Bridgnorth; near Berrington! and Boreton! Shropshire.

SCOTLAND:—Edinburgh. *Dr. Maingay*. Cramb's Wood, near Glamis, Forfarshire. *Mr. W. Gardiner*. Aberfeldy. *Rev. J. M. Crombie*.

IRELAND:—Near Belfast. *Mr. Templeton*.

Var. *sulphurella*, Fr. cinerascens, very thin, or obsolete; apothecia very slender.

On old trees, very rare. 1869.

SYN:—Fries L. E. p. 382. (1831); Nyl. Scand. 44.

EXS:—Schær. 639. Hepp 154. Nyl. 7. Arn. 318. Korb. 292.

GEOG. DISTRIB:—Europe, Sweden, Switzerland, France, Bavaria, Germany.

BOT. PROV:—2.

ENGLAND:—New Forest, Hants. *Rev. J. M. Crombie*. (1869).

2. *C. pallida*, Fr. albicans, very thin, or obsolete; apothecia small, stipes hyaline or pale yellow, rarely fuscous upwards, capitulum globose, sporal mass white or pallescent; spores colourless, spherical, large.

On trees, rare. 1805.

SYN:—*C. pallida*, Fr. Sched. Crit. 1, p. 3.

FIG:—E. Bot. 2557. Ann. & Mag. N.H. 1857, t. 8, f. 16. Nyl. Syn. t. 5, f. 38.

EXS:—Schær. 7. Zw. 101, 102. Tuck. 146. Hepp 44, 155.

GEOG. DISTRIB:—Sweden, Switzerland, Germany, Pyrenees, N. America.

BOT. PROV:—3...9...11.

ENGLAND:—Near Eglestone, Durham; East Common Wood, near Hexham and Felton. *Mr. Winch*. (1805.) Teesdale, Durham. *Rev. J. Harriman*. Clougha, Lancashire. *Mr. R. Jacob*. Oxford. *Mr. Baxter*.

3. *C. hyalinella*, Nyl. nearly obsolete; apothecia with a slender hyaline stipes, sporal mass globose, white

or pallido-rufescent ; spores colourless, sphaerical, very minute.

On old wood, rare. 1865.

SYN :—Nyl. Prodr. 33. (1861) ; Syn. 164. Crombie En. 14.

FIG :—Nyl. Syn. t. 5. f. 40.

EXS :—M. & N. 1162.

GEOG. DISTRIB :—Switzerland, Sweden.

BOT. PROV :—10.

ENGLAND :—Brantsdale, Yorkshire. *Mr. Mudd.* (1865).

#### IV. TRACHYLIA. *Fr. pr. p. Nyl.*

Thallus thin, granulose, or subleprose, or foreign. Apothecia black, sessile, cupuliform, open, sporal mass black. Spores nigricant or fuscous-black, ellipsoid or oblong, 1-septate, rarely pluriseptate. Spermatia oblong or ellipsoid.

1. *T. tigillaris*, *Fr. flavo-virescent or citrine*, granulose or granuloso-areolate ; *apothecia black, innate* or slightly prominent ; spores fusco-nigricant, oblong or ellipsoid. (K—)

On old posts, pales, &c., rare. 1805.

SYN :—*T. tigillaris*, *Fr. Scand. p. 282.*

FIG :—*E. Bot. t. 1530. Nyl. Syn. t. 5. f. 29.*

EXS :—M. & N. 1067. Schær. 451. Hepp 159. Rab. 214. Zw. 284. Anz. It. S. 44. Mudd 240.

GEOG. DISTRIB :—Scandinavia, Germany, Switzerland, Italy.

BOT. PROV :—3, 4.

ENGLAND :—Enfield Chace. *Mr. Dickson.* (1805). Walthamstow, Loughton, Essex. *Mr. E. Forster*, Southtown, near Yarmouth. *Mr. D. Turner.* Herringfleet, Suffolk. *Rev. G. R. Leathes.*

2. *T. tympanella*, *Fr. albicant or cinerascens*, granulose or granuloso-concrescent ; *apothecia black, prominent, margin of excipulum cinereo- or albo-suffused*, sporal mass black, slightly *cinereo-pruinose* ; spores fuscous, oblong, 1-septate. (K + )

On posts, palings, &c., very common. 1800.

SYN :—*T. tympanella*, *Fr. Scand. 282.*

FIG :—*E. Bot. 810. Nyl. Syn. t. 5. f. 32.*

EXS :—M. & N. 859. Schær. 438 Hepp 330. 331. Anzi It. S. 45. Langob. 211. Leight. 88. Mudd 240.

GEOG. DISTRIB :—Scandinavia, Switzerland, Italy, Algeria.

BOT. PROV :—2, 3, 4, 5...10.

ENGLAND :—Yarmouth. *Mr. D. Turner.* (1800). Essex. *Mr. Sowerby.* Ayton, Rosedale, Yorkshire! *Mr. Mudd.* Oswestry,

Shropshire. *Rev. T. Salwey*. Epping Forest. *Rev. J. M. Crombie*. Exminster Marshes, Devon. *Mr. Parfitt*. near Shrewsbury! Aymes-trey! Herefordshire.

IRELAND:—Curraghmore, near Waterford. *Adm. Jones*.

3. *T. stigonella*, Fr. *parasitic* on *Pertusariæ*; apothecia *scarcely prominent*, entirely black, *plane*; spores fusco-nigricant, ellipsoid, 1-septate, obtusely retundate at the apices.

On old oaks.

In *T. stigonella* the reaction K + is at first bright yellow, then changing to sanguineous.

SYN:—*T. stigonella*, Fr. Scand. p. 282.

FIG:—Nyl. Syn. t. 5. f. 33.

EXS:—M. & N. 858. Hepp 332. Schær. 502. Nyl. 17. Zw. 209, Leight. 226. Arn. 905.

GEOG. DISTRIB:—France, Germany, Switzerland, Bavaria.

BOT. PROV:—2, 3...5...7...10...11.

ENGLAND:—Teesdale, Durham. *Rev. J. Harriman*. Easby Wood, and near Ingleby, Yorkshire. *Mr. Mudd*. Sussex! *Mr. Borrer*. Essex! *Mr. H. Piggot*. Llanforda and Middleton Lane, near Oswestry, Shropshire! *Rev. T. Salwey*. Oakwood and Dilston Park, Northumberland. *Mr. Winch*. near Lyndhurst and Brockenhurst, New Forest. *Rev. J. M. Crombie*.

WALES:—Barmouth. *Rev. T. Salwey*.

## TRIBE II. SPHÆROPHOREI.

Thallus fruticulose, ramoso and ramulose, the apices subgloboso-incrassate enclosing the apothecia; apothecia nucleiform, enclosed, ultimately exposed by the dehiscence of the thalline covering; sporal mass black.

### I. SPHÆROPHORON. *Pers.*

Thallus caespitoso-fruticulose, smooth, polished, fragile; apothecia seated on the apices of the thallus, receptacle irregularly and variously dehiscent. Spores nigricant or violaceo nigricant, spherical or subglobose, covered with a black powder. Spermatia oblong.

1. *S. compressum*, Ach. pallido-albicant, ramoso, plano-compressed; apothecia obliquely innate on the apices, receptacle lacero-dehiscant or discoid and open; spores nigricant, spherical. (K --)

On rocks, rare. 1799.

SYN:—*S. compressum*, Ach. Meth. p. 135.

FIG:—E. Bot. 114. Leight. Ang. Lich. t. 1. f. 3.

EXS:—Rob. 13. Mudd 254. Auz. L. n. 66. 122.

GEOG. DISTRIB :—France, Switzerland, Germany, N. & S. America, Australasia.

BOT. PROV :—2...5 ..7, 8. 10, 11.. 14, 15...19...26...31.

ENGLAND :—Tunbridge. *Mr. E. Forster*. Cromford Moor, near Matlock. *Sir J. E. Smith*. Sussex! *Mr. Borrer*. Falcon Clints, Teesdale. *Mr. Baker*. High Green Wood, Heptonstall, Yorkshire. *Dr. Carrington*. Farndale and Hobhole, Yorkshire! *Mr. Mudd*. Kielder, Northumberland. *Prof. Balfour*. Craigforda and Mynydd-y-Myfyr, near Oswestry, Shropshire. *Rev. T. Salwey*. Eglestone; Kintsley; Muggleswick; Durham; Shaftoe Crags; Harbottle Moor; Gunnerston Crags; Cheviot; Hedgehope; Simonside; Northumberland. *Mr. Winch*. Malvern Hills, Worcestershire; Sugar-loaf, Monmouthshire. *Mr. Purton*.

SCOTLAND :—Dunearn, near Edinburgh. *Dr. Greville*. Clova Mountains. *Mr. G. Don*. Killin and Lochaber. *Rev. J. M. Crombie*.

IRELAND :—Connemara. *Dr. Moore*. Kerry. *Dr. Taylor*. Killarney. *Mr. Carroll*.

WALES :—Cwm Bychan, near Barmouth. *Rev. T. Salwey*. Aberdovey. *Rev. A. Bloxam*.

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey*.

2. *S. coralloides*, Pers. pale or whitish or reddish-brown, minutely and copiously branched, round, shining; apothecia black, terminal, globose, receptacle irregularly dehiscent above, persistent; spores violaceo-nigricant, spherical. (K—) I medulla blue.

On rocks, common. 1794.

SYN :—*S. coralloides*, Pers. in Ust. N. Ann. 1, p. 23.

FIG :—E. Bot. 115. Leight. Ang. Lich. t. 1. f. 1.

EXS :—Schær. 543. Hepp 217. M. & N. 262. Mudd 253. Anzi Langob. 421. Welw. 49.

GEOG. DISTRIB :—Europe, Madeira, Antarctic America, Australasia.

BOT. PROV :—1, 2.. 5...7, 8 ..10, 11...14...16...18, 19.

ENGLAND :—Sussex! *Mr. Borrer*. Bilsdale, Yorkshire. *Mr. Teesdale*. (1794). Mynydd-y-Myfyr and Craigforda! Shropshire. *Rev. T. Salwey*. Yorkshire! *Mr. Mudd*. Derbyshire. *Mr. Bohler*. Cromford Moor, near Matlock. *Sir J. E. Smith*. Murton Craigs. Penmanshiel. *Dr. G. Johnston*. near Castle Kern Bre, Cornwall. *Messrs Turner & Sowerby*. Peart's Crags; Stockdale Gill; Giggleswick Farm; near Park, beyond Ingleton, Yorkshire. *Dr. Windsor*. Teesdale; Weardale; Durham. Cheviot; Simonside; Hedgehope; Housesteads; Gunnerton Crags; near Harbottle and Heddon-on-the-wall, Northumberland. *Mr. Winch*. Malvern Hills, Worcestershire; Sugar-loaf, Monmouthshire. *Mr. Purton*.

SCOTLAND :—Pentland Hills. *Dr. Greville*. Highlands and Lowlands. *Sir W. J. Hooker*. Long Island; Arran; Hebrides. *Prof. Balfour*. Garrinahine. *Dr. Lindsay*.

IRELAND :—Bantry. *Miss Hutchins*. Lough Bray. *Adm. Jones*. Killarney. *Dr. Carrington*.

WALES:—Cwm Bychan. *Rev. T. Salwey*. Barmouth! *Mr. Lees*. Holyhead Mountain!

3. *S. fragile*, Pers. whitish, lurido-cinerascent or brownish, round, sparingly branched, densely cæspitose; apothecia black, terminal, globose, receptacle irregularly deliscent above, persistent; spores violaceo-nigricant, spherical or globoso-ellipsoid. (K + ) medulla I—.

On rocks, common.

SYN:—*S. fragile*, Pers. in *Ust. N. Ann.* 1. f. 23.

FIG:—*E. Bot.* 2474. *Leight. Ang. Lich.* t. 1. f. 2.

EXS:—*M. & N.* 263. *Anzi It.* S. 34. *Fellm.* 21. *Hepp* 664. *Schær.* 15.

GEOG. DISTRIB:—Europe, Arctic Europe, Antarctic America.

BOT. PROV:—1...5.. 8...10 ..14, 15 ..18, 19...29.

ENGLAND:—St. Cleere, near Liskeard. *Messrs Turner & Sowerby*. Charnwood Forest, Leicestershire! *Rev. A. Bloxum*. Craigforda, near Oswestry! *Rev. T. Salwey*. Yorkshire. *Mr. Mudd*. Harrogate, Yorkshire. *Mr. Teesdale*. Cheviot; Hedgehope; Simonside; Harbottle; Northumberland. Weardale and Teesdale, Durham. *Mr. Winch*. Stiperstones Hill! Shropshire.

SCOTLAND:—Pentland Hills. *Dr. Greville*. Hebrides. *Prof. Balfour*. Braemar. *Rev. J. M. Crombie*.

IRELAND:—Malin Head, co. Donegal. *Dr. Dickie*. Killarney. *Dr. Carrington*.

## SERIES II. CLADODEI.

Thallus generally erect; apothecia terminal on podetia (rarely without), biatorine, rarely lecanorine; spores 8, colourless, generally oblong and simple, sometimes elongate and septate; paraphyses distinct.

## TRIBE. III. BÆOMYCEI.

Thallus horizontally expanded, crustaceous. Apothecia pale or rufescent, sessile or podetiiform-stipitate; spores simple or septate.

## I. GOMPHILLUS. *Nyl.*

Thallus very thin, consisting of spherical gonidia and irregular filaments conglutinated. Apothecia stipitate, small, corneous. Spores 8, filiform, multiseptate. Paraphyses indistinct. Sterigmata simple. Spermatia slender, cylindrical, straight.



1. *G. calycioides*, Nyl. cinerascens or cinereo-virescent, thin, effuse or obsolete; apothecia small, stipitate, capitulum subturbinate, nigricant; spores very long, cylindrical, 60-100-septate.

On mosses, &c., rare.

SYN :—*G. calycioides*, Nyl. Prodr. p. 146.

FIG :—Nyl. Syn. t. 7. f. 3.

EXS :—Rab. 736. Mass. 85. Anzi Langob. 17.

GEOG. DISTRIB :—France, Italy.

BOT. PROV :—19.

IRELAND :—Carig Mountain, co. Kerry. *Dr. Taylor*. Turk Mountain, Killarney; *Mr. Carroll*.

The Irish plant is the var. *microcephala*, Nyl. Syn. 175. "minor, apotheciis minoribus parum stipitatis."

## II. BÆOMYCES. *Pers.*

Thallus crustaceous, pulvereous, granulose or squamulose. Apothecia biatorine, sessile or stipitate. Sterigmata articulate. Spermatia cylindrical, straight.

1. *B. rufus*, DC. albo-virescent or albido-glaucous, thin, effuse, minutely granulose or squamulose or leprose, granules depressed; apothecia carneo-rufescent or carneo-fuscescent, somewhat convex, immarginate, stipes moderate or very short, whitish; spores 6 or 8, oblongo-ellipsoid, simple, colourless.

On earth and stones, not uncommon.

SYN :—*B. rufus*, DC. Fl. Fr. 2. p. 342.

FIG :—E. Bot. 373. Nyl. Syn. t. 1. f. 12. t. 6. f. 12. 13. 14.

EXS :—Tuck. 41. Anzi It. S. 32. 33. Fellm. 22. Nyl. 27. M. & N. 70. Schær. 32. Mudd 30. Larb. 6. Leight. 178.

GEOG. DISTRIB :—Europe, America, N. Zealand.

BOT. PROV :—1...3, 4, 5.. 7...10...13, 14, 15....20...31.

ENGLAND :—Epping Forest and Hornsey Wood. *Sir J. E. Smith*. Berwick-on-Tweed. *Dr. G. Johnston*. Whitsuncliffe! Yorkshire. *Mr. Baker*. near Ayton! Cleveland. *Mr. Mudd*. Dartmoor and Lustleigh Cleeve, Devon. *Mr. Parfitt*. Ampthill, Beds. *Rev. C. Abbot*. Scotswood; Heaton Denes; Caervoran; Twizell Dene, Northumberland. *Mr. Winch*. Shotover Hill, Oxford. *Mr. Baxter*. Tip-tree Heath, Warley, Essex. *Mr. Varcne*. Stiperstones! Haughmond Hill! Whitecliff Woods, near Ludlow! between Hopton and Great Ness! Long Mynd!, Shropshire.

SCOTLAND :—Glasgow. *Sir J. E. Smith*. Rosslyn and Auchindenny Woods; Brand Hermitage, near Edinburgh. *Dr. Greville*. Baldoan; Sidlaw Hills. *Mr. W. Gardiner*. Den of Balthayock, Perth-

shire! *Dr. Ogilvie*. Kinfauns, Perth! *Dr. Lindsay*.

IRELAND:—Glen Girnac. *Rev. J. M. Crombie*.

WALES:—Barmouth!

CHANNEL ISLANDS:—Rozel Manor, Jersey. *Mr. Larbalestier*. Guernsey. *Rev. T. Salwey*.

When hydrate of potash is applied, the thallus becomes yellow (K +) but it has no effect on the apothecia (K—). The thallus when growing on stones is minutely depresso-granular, but when growing on the earth the granules becomes squamulose, and it then constitutes the variety *carneus*, Flk. D.L. 8, which occurs in the Channel Islands, and at Glengarriff, Ireland. see Larb. 7.

2. *B. roseus*, Pers. whitish, granuloso-crustaceous, (K faint yellow); apothecia roseo-carneous or albo-carneous, subglobose, stipitate, (K orange); stipes white, roundish, short; spores 6 or 8, fusiformi-oblong or fusiform, simple or obsoletely 1-septate; iod. faint blue.

On the earth, rare.

SYN:—Pers. in Ust. N. Ann. 1. p. 19.

FIG:—E. Bot. 374. Nyl. Syn. t. 6. f. 15. 16. 17. 18. 19. 20. 21.

EXS:—Nyl. 26. M. & N. 71. Anzi It. S. 31. Mudd 31. Schaer.

31. Hepp 119. Mass. 82. Tuck. 40. Leight. 355.

GEOG. DISTRIB:—Europe, America, N. Zealand.

BOT. PROV:—1...4, 5...7...10, 11...14...15 19...25.. 26.

ENGLAND:—Kielder, Northumberland. *Prof. Balfour*. Carlton Beck! and Loundsdale! Cleveland. *Mr. Mudd*. near Exeter. *Mr. Parfitt*. Amptull, Beds. *Rev. C. Abbot*. Wapley Hill! Herefordshire.

SCOTLAND:—Pentland Hills. *Dr. Groville*. Baldoan, Sidlaw Hills and Clova. *Mr. W. Gardiner*. Blaeberry Hill! Perth. *Dr. Lindsay*.

IRELAND:—Near Clonmel! *Mr. Wright*. Connemara. *Dr. Moore*. Killarney. *Dr. Carrington*.

WALES:—Valley above Borthwnog; Hendreforion and near Barmouth. *Rev. T. Salwey*. Montgomeryshire. *Sir J. E. Smith*. Crib Goch! Snowdon.

3. *B. placophyllus*, Ach. whitish or glaucescent, crustaceo-imbricate, adnate, corrugate or squamoso-lobate, plicate and suberenuate, (K yellow); apothecia carneo-rufescent or carneo-fuscescent, stipitate, (K—) stipes apically divided, and bearing several aggregate and confluent apothecia; spores oblongo-ellipsoid, simple.

On the earth, very rare.

SYN:—*B. placophyllus*, Ach. Meth. p. 322.

FIG:—Ach. Meth. t. 7. f. 4.

EXS:—Tuck. 42.

GEOG. DISTRIB:—N. Europe, N. America.

BOT. PROV:—7...12...15.

ENGLAND :—Cumberland ! *Mrs. Stanger*. Eglestone, Durham. *Rev. J. Harriman*.

SCOTLAND :—Sidlaw Hills. *Mr. W. Gardiner*. Foot of Ben Lawers. *Adm. Jones*. Grampians ; Braemar ; Morrone. *Rev. J. M. Crombie*.

WALES :—At foot of Cader Idris. *Mr. Ralfs*. Arran Fowdwy. *Mr. Borrer*. rocks behind Union Workhouse, Corwen ; Barmouth. *Rev. T. Salwey*.

4. *B. icmadophilus*, (Ehrh.) glaucescent or whitish, granulato-rugose or subleprose, moderate, (K yellow) ; apothecia pale flesh-coloured, discoid, biatorine, plane, or sub-lecanorine, (K brown) ; spores 6 or 8, fusiform, 1-3-septate ; iod. pale blue.

On the earth, not common.

SYN :—*L. icmadophilus*, Ehrh. Phytogr. No. 40.

FIG :—E. Bot. 372. Nyl. Syn. t. 6. f. 2. 7. 8, 9, 10, 11.

EXS :—M. & N. 173. Tuck. 43. Mass 5. Anzi It. S. 224. Hepp 137. Mudd 32. Fellm. 24. Schær. 46.

GEOG. DISTRIB :—Europe, N. America, E. Indies.

BOT. PROV :—4...8...10.

ENGLAND :—Matlock. *Sir J. E. Smith*. Yorkshire ! *Mr. Dixon*. Guisboro' Moor ! and Oggeray Gill ! Cleveland. *Mr. Mudd*. Bedfordshire. *Rev. C. Abbot*. Houghton Moor, Yorkshire. *Mr. Teesdale*. Moughton, near Settle. *Dr. Windsor*.

SCOTLAND :—Long Island. *Prof. Balfour*. Den of Balthayock, Perthshire ! *Dr. Ogilvie*. Grampians. *Rev. J. M. Crombie*. Ben Lawers ; Ben More ; Crainlarich. *Dr. Holl*.

IRELAND :—Pass of Keim-an-Eigh-Wist, co. Cork ! *Mr. Carroll*.

WALES :—Cwn Bychan ! *Rev. T. Salwey*. near Dolgelly !

## TRIBE IV. CLADONIEI.

Thallus partly or entirely laciniato-foliolose, or squamoso-foliolose, or fruticulose or caespitose, with fistulose podetia, often ramose. Apothecia biatorine, or cephalodine, convex, immarginate, on the podetia, rarely on the leaflets. Spores simple.

### I. CLADONIA, *Hoffm.*

Thallus either tubulose or laciniiform, podetia generally dilated at the apex into scyphi ; thallus generally foliolose, or squamulose at the base, sometimes only granuloso-crustaceous. Apothecia variously coloured, but never black. Spores small, oblong.

SUB-GENUS I. PYCNOTHELIA. *Ach. Duf. Nyl.*

Thallus crustaceous ; podetia clavate, papillæform, simple or branched, glabrous ; apothecia fuscous.

\* *Reaction*, ( $K + C -$ ).

1. *P. papillaria*, Duf. pale and yellowish, *granuloso-crustaceous* ; podetia small ( $\frac{1}{2}$  inch), erect, *clavato-cylindrical*, simple or branched.

Heathy ground, not common.

SYN :—Duf. Rev. Clad. 5. (1818). Nyl. Syn. 185.

FIG :—E. Bot. t. 907. Dill. t. xvi. f. 28. Sturm. D. F. t. 22.

Exs :—Leight. 208.

GEOG. DISTRIB :—Europe, N. America.

BOT. PROV :—2...5...7, 8...10, 11, 12...15, 16...19 23, 24.

ENGLAND :—Westmoreland ! *Mrs. Stanger*. Yorkshire ! *Messrs Dixon & Mudd*. Bournemouth, Hants ! *Rev. A. Bloxam*. Craigforda. *Rev. T. Salwey*. Ravensworth ; Butsfield ; Woodlands ; Eglestone ; Durham. Cheviot ; Hedgehope ; Wallington Moors, Northumberland. *Mr. Winch*.

SCOTLAND :—Appin ! *Capt. Carmichael*. Ben Nevis ! *Sir W. J. Hooker*. Loch Callater ! *Mr. Croall*.

IRELAND :—South of Ireland. *Dr. Taylor*. Howth. *Adm. Jones*. Doneraile Mountains ; Kilkee. *Mr. Carroll*. Killarney. *Miss Hutchinson*. near Belfast. *Mr. Templeton*.

WALES :—Near Barmouth. Llandrindod Wells, Radnorshire. *Rev. T. Salwey*.

SUB-GENUS II. CLADONIA. *Hoffm. Nyl.*

Thallus leafy ; podetia scyphiphorous or branched, more or less pulveraceous and squamose ; apothecia terminal, biatorine, pale or red.

A. *Phæocarpæ*, apothecia fuscous or pale.

\* *Reaction*, ( $K f + C +$ )

1. *C. endiviæfolia*, Fr. thallus *macrophylline*, spreading, yellow-green above, whitish beneath, *lacinia* (1—2 inch) long, *multifid*, *rotundo-crenate* at the apex ; podetia rare, small, cylindrical, from upper surface of the lacinia ; apothecia pale or fuscous.

Dry heaths and rocks, rare.

Distinct from *alcicornis*, ( $K - C +$ ) by the different reaction.

SYN :—Fr. L. E. 212. (1831). Nyl. Syn. 189.

FIG :—E. Bot. t. 2361. Mich. Gen. t. 24. f. 3.

Exs :—Schær. 456. Nyl. 106. Larbal. 56.

GEOG. DISTRIB :—Switzerland, Italy, Spain, Portugal, Algeria, Canaries.

BOT. PROV :—1, 2, 3, 4 ..6 ..15...20...31.

ENGLAND :—Surrey. *Mr. Dickson*. (1795). Yarmouth. *Mr. D. Turner*. Newhaven, Sussex ; Start Point, Devon ; Esher, Surrey. *Mr. Borrer*. Rackham Common ! Sussex. *Mr. Jenner*. Lustleigh Cleve, near Moreton, Devon. *Mr. Parfitt*.

SCOTLAND :—Carse of Ardersier ! *Mr. Croall*.

IRELAND :—Glengariff. *Adm. Jones*.

WALES :—Gilton Point, Tenby ! *Rev. T. Salwey*.

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey*. Jersey ! *Mr. Larbalestier*.

**\*\* Reaction, (K + C + )**

2. *C. pungens*, Flk. thallus squamulose, evanescent ; podetia fruticose, (1—3in.) erect, much and intricately-branched, attenuato-subulate, and divergenti-furcate at the apex, pale greyish green, glabrous, more or less sub-decorticate, or adnately verrucose, and squamose ; apothecia small, subsphærical, pale.

Hilly slopes, common. 1812.

SYN :—Flk. Clad. 156. (1828). Nyl. Syn. 107.

FIG :—E. Bot. t. 2444. Dill. t. xvi. f. 30.

EXS :—Leight. 13. 369. 374.

GEOG. DISTRIB :—Europe, Africa, India, Tropical America, S. America, Australasia.

BOT. PROV :—2, 3, 4...7 . 15.

ENGLAND :—Esher Common ! Surrey. *Mr. Borrer*. (1812) Thetford ! *Sir W. J. Hooker*. Basingstoke ! Kent, and Winchfield ! Hants. *Mr. R. S. Hill*.

SCOTLAND :—Tay Bank. West Water ; White Hill : Baldoran Woods ! Forfarshire. *Mr. W. Gardiner*. Blaeberry Hill ! Perth. *Dr. Lindsay*.

WALES :—Barmouth.

CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier*.

A foliaceous form, (f. *foliosa*, Flk. = Mudd Brit. Clad. 56 !) in a dense entangled depressed mass, occurs in Durham ! Kent ! and Leicestershire ! and Hants ! and is identical with *nivea*, Ach. spec. in hb. Kew !

The smooth pale greyish-green cortex, is more or less parted by irregular whitish reticulations, and often becomes sub-decorticate, with aduate verrucæ, which sometimes are developed into scales or leaflets. This is also the case in *furcata*, but the different chemical reaction will always distinguish them.

3. *C. turgida*, Hffm. whitish or glauco-cinerascent, basal leaflets laciniiform, variously divided and crenate, more or less ascending, podetia smooth, squamoso-decorticate,



*turgido-cylindrical*, branched, slightly dilated, and open at the truncate, dentato-radiate apices.

In rocky mountain ranges, rare. 1870.

SYN :—Hffm. Fl. Germ. 124. (1795). Nyl. Scand. 55. Crombie En. 20. *Bæomyces parecha*, Ach! Syn. Meth. 350.

EXS :—Fellm. 37. Tuck. 24. Fries 147. (side Nyl.)

GEOG. DISTRIB :—Northern Europe, Asia, Himalayas, N. America, Chili.

BOT. PROV :—15.

SCOTLAND :—Braemar, Grampians. Rev. J. M. Crombie. (1870).

\*\*\* *Reaction*, (*K + C*—)

4. *C. cervicornis*, Schær. thallus *macrophylline*, *cæspitose*, sub-erect, *narrowly laciniato-multifid*, crenate, cartilaginous, glaucous-green above, white beneath, purplish-black at the base ; podetia from disk of laciniae, short, slender, *smooth or subverrucose*, scyphiferous ; *scyphi simple and leafless, or irregularly proliferous, and more or less squamose*.

Hills and rocky places, common. 1782.

SYN :—Schær. Enum. 195. (1850). Nyl. Syn. 197, in part ; a. and b. Mudd Brit. Clad. 4, *Cl. gracilis* a, Mudd Man. 54.

FIG :—E. Bot. t. 2574.

EXS :—M. & N. 749. Schær. 457.

GEOG. DISTRIB :—Europe, Australasia.

BOT. PROV :—1. 3...5...7...10, 11...13, 14, 15, 16...18, 19...31.

ENGLAND :—Dartmoor ! Rusthall Common ! Kent. Mr. Borrer. Yorkshire ! Mr. Mudd. Buttsfield, Durham. Mr. Winch. Shropshire !

SCOTLAND :—Pentland Hills, near Edinburgh. Sir J. E. Smith. (1782). Highlands ! Sir W. J. Hooker. Sidlaw Hills ! Mr. W. Gardiner. Ben-na-Bourd ! Mr. Croall. Long Island ; Hebrides ; Arran. Prof. Balfour. Hattfell, Moffat. Dr. Nichol. Dunearn, Dr. Gerrie. Succoth Hill, Arrochar ! Mr. Mc Kintay.

IRELAND :—Bantry. Miss Hutchins. Killarney. Dr. Carrington.

WALES :—Barmouth.

CHANNEL ISLANDS :—Guernsey. Rev. T. Salvey. Jersey ; Sark. Mr. Larbalestier.

Laciniae frequently more or less thickened, and slightly recurved at the margins, rimoso-reticulate on upper surface, obscurely longitudinally veined beneath, and minutely verrucose at apex, but these characters do not seem constant.

The different reaction keeps this distinct from *gracilis*, *verticillata*, and *sobolifera*.

5. *C. cariota*, Flk. thallus ashy-green, scales minute, crenate, more or less investing the base of the podetia ; podetia whitish,  $\frac{1}{2}$ —1 in. high, cylindrical, dilated up-

wards, *carioso-cancellate* or *eroso-lacunose granulato-verrucose*, scyphi digitato-partite, fastigiate.

On the earth, rare. 1832.

The re-action separates from *pyxidata*, *pityrea*, *decorticata*, *degenerans*, *botrytes* and *mitrula*,

I have seen small specimens from Ireland, similar to "*forma juvenilis*," Hepp 541 and 542, and probably referable to *symphyccarpa*, Ach! in hb. Kew. L. *microphyllus*, E. Bot. 1782, is referable to *leptophylla* of *C. pyxidata*.

SYN:—Flk. Clad. 11. a. (1828). Nyl. Syn. 194. Mudd Man. 55.

FIG:—E. Bot. Suppl. t. 2761.

EXS:—M. & N. 850. Schær. 510.

GEOG. DISTRIB:—Europe, N. America.

BOT. PROV:—2..4.. 10, 11...13...19.

ENGLAND:—Teesdale! *Mr. Robertson*. (1832). Lound Heath, near Yarmouth. *Mr. D. Turner*. Horsmonden! Sussex; Ecclesbourne, near Hastings! *Mr. Jenner*. St. Leonard's Forest! Sussex. *Mr. Borrer*.

SCOTLAND:—Lochaber. *Rev. J. M. Crombie*.

IRELAND:—Near Bantry! *Miss Hutchins*.

6. *C. delicata*, Flk. thallus *cæspitose*, *microphylline*, white or brownish-grey, *leaflets minute*, *eroso-laciniate*, *laciniae narrow*, *minutely incised* or *crenate* and *granular at the margins*; podetia slender, simple or divided,  $\frac{1}{4}$  in, thickened upwards, cartilaginous, glabrous, longitudinally ribbed or fissured, more or less with granular scales.

On old rails, not common.

The reaction (K + C—) distinguishes this from *cæspititia*, Flk. (K—C—), from *squamosa*, Hffm. (K—C—), from *pyxidata*, var. *pityrea*, (K—C—); and that and the characters of the podetia, would seem to ally this with *cariosa*.

SYN:—Flk. Clad. 7. (1828). Nyl. Syn. 1. 210. in part; *Scyphophorus parasiticus*, Hook Brit. 237. *Cenomycce parasitica*, Mack. Hib. 80.; *Cladonia squamosa* v. *delicata*, Mudd Man. 56. Brit. Clad. 21.

FIG:—E. Bot. t. 2052.

EXS:—Leight. 382.

GEOG. DISTRIB.—Europe, Tropical America.

BOT. PROV:—2...4, 5.. 10, 11...16.

ENGLAND:—St. Leonard's Forest! Sussex. *Mr. Borrer*. Barham, Suffolk, and Holt Wood! *Sir W. J. Hooker*. Yorkshire! *Mr. Mudd*. Bagot's Park! Staffordshire. *Rev. A. Bloxam*. Lancaster, Durham. Dilstone Park; Cheviot, Northumberland. *Mr. Winch*. Herefordshire! Shropshire!

SCOTLAND:—Appin. *Capt. Carmichael*.

IRELAND:—Common. *Dr. Taylor*.

Var. *subsquamosa*, Nyl. thallus *squamulose* ; podetia whitish, (1—2 in.), partially glabrous, cartilaginous, longitudinally ribbed or fissured, *clothed at intervals at the base with spreading incised and crenate scales, granulate in the upper part, branched, radiato-cristate, sub-corymbose.*

Woods and rocks, rare.

Different reaction keeps this distinct from *pyxidata* var. *decor-ticata*, and from *squamosa*.

SYN:—*Cladonia squamosa*, Nyl. Syn. 1. 209. in part ; *Scyphophorus sparassus*, Hook Brit. 2. 237. in part ; *Cenomyce sparassa*, Mack. Hib. 80.

EXS:—Leight. 405. Bohl. 16. Schær. 74.

GEOG. DISTRIB:—N. Europe, N. America, S. America, India.

BOT. PROV:—5...8...10...19.

ENGLAND:—Yorkshire ! Mr. Mudd. Leicestershire ! Rev. A. Bloxam. Bolsley, near Thirsk ! Mr. J. G. Baker. Shropshire ! Rev. T. Salwey.

IRELAND:—Dunkerron. Dr. Taylor. Killarney. Mr. Carroll.

\*\*\*\* Reaction. (K—C + )

7. *C. alcicornis*, Flk. thallus *macrophylline*, foliace-ous, spreading, yellow-green above, white beneath, *laciniae* narrow, *palmato-multifid*, *inciso-crenulate at apex*, *margins with black fibres* ; podetia springing from upper surface of *laciniae*.

Dry heaths, not common.

Smaller and narrower than, but similar in general appearance to *endiviæfolia*, from which the above characters, and the different reaction keep it distinct.

SYN:—Flk. Clad. 23. (1828). Nyl. Syn. 1. 190 ; *Scyphophorus alcicornis*, Hook. Brit. 238 ; Scot. 62. *Cladonia endiviæfolia* var. *alcicornis*, Mudd Man. 52. Brit. Clad. 3. .

FIG:—Dill. t. xiv. f. 12. A. ; Vaill. Paris. t. 21. f. 3.

EXS:—Leight. 15.

GEOG. DISTRIB:—Europe, Africa, America.

BOT. PROV:—4, 5...10, 11...14, 15...19...31.

ENGLAND:—Near Hengrave, Suffolk and Aldborough ! Sir T. Gage. Yorkshire. Mr. Mudd. Worcestershire. Rev. J. H. Thompson. Houghton Moor, Yorkshire. Mr. Teesdale. Northumberland and Durham. Mr. Winch. Malvern Hills, Worcestershire ; Morf, Salop. Mr. Purton. Shropshire. !

SCOTLAND:—Pentland Hills and Duncarn, Edinburgh. Dr. Greville. Grampians. Rev. J. M. Crombie.

IRELAND:—Killarney. Dr. Carrington.

CHANNEL ISLANDS:—Guernsey. Rev. T. Salwey. Jersey, Sark. Mr. Larbalestier.

\*\*\*\*\* *Reaction (K—C—)*

8. *C. pyxidata*, Fr. thallus squamulose, ash-green ; podetia *cartilagineo-corticate*, verrucose, or coarsely granulato-pulveraceous, or scaly downwards ; scyphi *cylindrical*, more or less proliferous.

Heaths, woods, hedge banks, common.

SYN:—Fr. L. E. 216. (1831) ; Nyl. Syn. 1. 192. Mudd Man. 53. Brit. Clad. 7. *Scyphophorus pyxidatus*, Hook. Brit. 238 ; *Cenomyce pyxidata*, Hook. Scot. 62 ; *Cenomyce coccifera*, Mack. Hib. 81. in part.

FIG:—Dill. t. xiv. f. 6. A, f. 6. C, f. 6. I—M, f. 9, A. E. Bot. t. 1393.

EXS:—Leight. 407.

GEOG. DISTRIB:—Europe, India, N. & S. America, Australasia.

LOCALITIES:—Generally throughout England, Scotland, Hebrides, Ireland, N. & S. Wales, and Channel Islands.

It seems only to create perplexity, to attempt to describe or particularize the innumerable modifications of this polymorphous species, which in reality, have no definite limit, and arise from local circumstances of climate, humidity, &c. They may be all readily referred to the following varieties, by careful attention to the prominent character.

Var. *vera pyxidata*, podetia continuously corticate, *granulato-verrucose*.

EXS:—Leight. 407 !

Var. *pityrea*, Ach. podetia *pulverulento-granuloso-furfuraceous*, ashey-white, *smooth and decorticate*, and often ribbed or laciniose in the *upper part*.

GEOG. DISTRIB:—Europe, India, N. & S. & Tropical America, Africa, Australasia.

In the Hookerian herb. at Kew there are specimens gathered at Killarney, (lib. D. Turner) and Forfarshire, (A. Croall.) identical with *acuta*, Tayl. which appears to be only a subulate form of *pityrea*.

Var. *chlorophaea*, Flk. podetia *pulverulent*, *granules coarser* at the base, *sulphury-yellow*.

EXS:—Larbal. 58.

GEOG. DISTRIB:—Europe, Africa, N. & S. & Tropical America, Australasia.

Var. *caespititia*, Flk. thallus *caespitose*, *compressed* ; leaflets *laciniato-lobate*, margins *crenate*, or *eroso-lacinate* ; podetia arising from disk of laciniae, *very short*, simple or divided, glabrous, subcostate, sometimes sub-verru-

cose or scaly ; *apothecia conglomerate, apparently sessile, pale flesh-brown.*

On earth and rocks, not common.

Coëmans in Clad. Achar. says he has frequently observed the transition from *pityrea* into *caespititia*. The different reaction separates it from *delicata*.

SYN:—Flk. Clad. 8. (1828). Nyl. Syn. 1. 210. *Scyphophorus caespititius*, Hook. Brit. 236 ; *Cladonia squamosa* var. *caespititia*, Mudd Man. 57. Brit. Clad. 21.

FIG:—E. Bot. t. 1796. (orig. spec. in hb. Borrer !)

EXS:—Leight. 368 ! Mudd Clad. Brit. 44 ! Bohl. 72 !

GEOG. DISTRIB:—Europe, America.

BOT. PROV:—2 .5...7 .11...15...19.. 31.

ENGLAND:—Hampshire ! Mr. Lyell. Ardingley ! Sussex. Mr. Jenner. Hassocks ! Sussex and on Hungershall Rocks ! Mr. Borrer. Craigforda. Rev. T. Salwey. Pamber Forest, Hants. Rev. J. M. Crombie. Heaton Dene, Northumberland. Mr. Winch. Shropshire !

SCOTLAND:—Loch Katrine ; Lochaber. Rev. J. M. Crombie.

IRELAND:—Miss Hutchins & Sir T. Gage ! Killarney. Dr. Carrington.

WALES:—Hill above Bodowen, Barmouth. Rev. T. Salwey.

CHANNEL ISLANDS:—Gorey ; Rozel ; Jersey. Mr. Larbustier.

Var. *leptophylla*, Flk. thallus *squamulose, squamules small, dispersed, rounded, nearly entire* ; podetia short, simple or divided, glabrous or subverrucose, subcostate ; apothecia solitary, *capitate, brown.*

Wet heathy places, rare.

Of this I have seen no British specimens, but possess an authentic one from Dr. Nylander, collected in Java, 7000 ft. alt. Coëmans (Clad. Achar.) states that the Acharian herbarium at Helsingfors, contains a specimen of this lichen from England, and that he considers it as a variety of *cariosa*, which it certainly generally resembles, but the different reaction keeps them quite distinct.

SYN:—Flk. Clad. 19. (1828). Nyl. Syn. 1. 193. *Scyphophorus microphyllus*, Hook. Brit. 237 ; *Cladonia squamosa* var. *leptophylla*, Mudd Man. 57 ; *Cladonia cariosa* var. *leptophylla*, Mudd Brit. Clad. 6.

FIG:—E. Bot. t. 1782.

EXS:—Coëm. Clad. Belg. 22 ! Hepp 543 !

GEOG. DISTRIB:—France, Switzerland.

BOT. PROV:—2.

ENGLAND:—Tilgate and St. Leonard's Forests, Sussex. Mr. Borrer.

Var. *fimbriata*, Hoffm. thallus white, squamulose ; podetia *membranaceo-corticate, deliquescing into a fine*



*white impalpable powder*, sometimes scaly from the base upwards.

SYN :—Hoffm. Fl. Germ. 121. (1795.) Nyl. Syn. 1. 194.

FIG :—Dill. t. xiv. f. 8. f. 16. A, B. D. F. G.—Vaill. Paris. 21. f. 6.—8. E. Bot. t. 2438.

EXS :—Leight. 325 ! 376 ! 377 ! Mudd Brit. Clad. 13 ! 14 ! 15 !

GEOG. DISTRIB :—Europe, Africa, India, N. & S. & Tropical America, South Atlantic, Australasia, South Indian Ocean.

Of this common lichen, there are two conspicuous forms or states :—*tubæformis* in which the podetia are elongated and *trumpet-shaped* (Schar. L.H. 58 ! and Leight. 377 !) : and *cornuto-radiata*, in which the podetia are very much elongated, simple, *cornute*, or irregularly scyphiferous and *radiato-fimbriate*. (Leight. 376 ! and Mudd Br. Clad. 19 !)

Var. *decorticata*, Flk. podetia elongated, cylindrical, attenuated, *white, decorticate, squamose at the base, coarsely granulato-pulverulent above*.

SYN :—Flk. Clad. 10. (1828.) Nyl. Syn. 193.

EXS :—Coëm. Clad. Belg. 95 ! 99 !

GEOG. DISTRIB :—Africa, India, N. Tropical & S. America. Australasia.

BOT. PROV :—7, 8...15, 16...20.

ENGLAND :—Leicestershire ! *Rev. A. Bloxam*.

SCOTLAND :—Killin ; Grampians. *Rev. J. M. Crombie*.

IRELAND :—Kilmore, near Fermoy ! *Mr. Carroll*.

WALES :—Aberdovey ! *Rev. A. Bloxam*.

9. *C. gracilis*, Hoffm. thallus pale ashey-green or livid brown, leaflets at the base often evanescent : podetia elongate, *filiform, subulate*, or *scyphiferous and proliferous, corticate, glabrous* ; apothecia pedicillate or sessile, fuscous.

Mountains and heaths, common.

Of the primary robust scyphiferous and proliferous form *hybrida*, (Ach.) represented by Dill. t. XIV. f. 13. B. and Schar. 66 ; nor of the robust gigantic extended form, *macrocerus*, (Ach.) represented by Schar. 68 ; nor of the slender elongated form, *elongata*, Ach. represented by Tuck. 28 ; nor of the squamulose form, *aspera*, Flk. represented by Schar. 67. 641 ; nor of the var. *cornuta*, (*C. cornuta*, Fr. 225. Nyl. Syn. 1. 198.) podetia stout, elongate, chiefly subuliform-cornute, a few with narrow irregular subradiate scyphi, glabrous at the base, and subpulverulent above, represented by Anzi Clad. Cisalp. 9. Fellm. Lapp. Or. 31 ; I have seen no British specimens, except a doubtful one of this latter from Ireland, Miss Hutchins in hb. Hook.

SYN :—Hoffm. Fl. Germ. 119. (1795.) Nyl. Syn. 1. 196 ! Mudd Mm. 54. in part. Brit. Clad. 16 ; *Scyphophorus gracilis*, Hook. Brit. 239. *C. macrocerus gracilis*, Hook Scot. 63 ; Mack. Hib. 82.

GEOG. DISTRIB :—Europe, N. & S. America, Australasia, India.

The forms or varieties which occur in Britain are these :—

Var. *chordalis*, (Ach.) podetia slender, *subuliform*, with *narrow cup-shaped* scyphi *denticulate* on the margins.

SYN :—Ach. Syn. 262. (1817).

FIG :—E. Bot. t. 1284.

EXS :—Schær. 64. Leight. 296. Mudd Br. Clad. 34 ! 35 ! 37 !

GEOG. DISTRIB :—Europe, Arctic and Antarctic America.

BOT. PROV :—1, 2...5...7...10, 11, 12...14, 15...19...30, 31.

ENGLAND :—Yorkshire ! *Mr. Mudd*, Aldershot ! Hants. *Mr. R. S. Hill*, Keswick ! *Mrs. Stanger*, Blackstore Rock, Devon. *Mr. Parfitt*, Northumberland and Durham. *Mr. Winch*, Malvern Hills, Worcestershire. *Mr. Purlton*, Tiptree Heath, Essex. *Mr. Varenne*, Longmynd ! Wrekin ! Stiperstones ! Shropshire.

SCOTLAND :—Glen Callater ! Lion's Face ! and Sidlaw Hills ! and Morne ! *Mr. Croall*, Ben Lawers ! *Mr. D. Turner*, Pentland Hills. *Dr. Greville*.

IRELAND :—Derry. *Dr. Moore*, Bantry ! *Miss Hutchins*.

WALES :—Barmouth !

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey*. Jersey, Sark, &c., *Mr. Larbalestier*,

Var. *abortiva*, Schær. podetia subuliform, recurved or hooked at the apex, sterile.

EXS :—Schær. L. H. 69 ! Mudd Br. Clad. 26 !

ENGLAND :—Yorkshire ! *Mr. Mudd*.

Var. *schrochlorea*, Flk. Clad. 75. Nyl. Syn. 1. 198. a smaller form of about one inch high of *cornuta*, represented by Schær. 640 ! Mudd Br. Clad. 23 ! 24 ! 25 ! 26 !

Rare, Cleveland, Yorkshire, ! *Mr. Mudd*.

10. *C. verticillata*, Flk. thallus foliaceo-squamulose, leaflets laciniaeform, crenato-incised ; podetia ashey-grey, corticate, glabrous or subverrucose, scyphiferous, scyphi denticulate at the margins, 2—4 times repeatedly *verticillato-proliferous* and *scyphiferous* from centre of scyphi ; apothecia fuscous.

Rocks and mountainous districts, rare.

SYN :—Flk. Clad. 26. (1828). Nyl. Syn. 1. 197 ; *Cladonia gracilis* v. *verticillata*, Mudd Man. 54 ; *Cladonia corricornis* v. *verticillata*, Mudd Br. Clad. 5.

FIG :—Dill, t. xiv. f. 6. G. H.—Vaill. Paris. 21. f. 5.

EXS :—M. & N. 644 ! Mudd Brit. Clad. 3 !

GEOG. DISTRIB :—Europe, N. America, Australasia.

BOT. PROV :—2...7...10...31.

ENGLAND :—Yorkshire ! *Mr. Mudd.* Broadwater Forest, Tunbridge Wells ! *Mr. Jenner.*

WALES :—Barmouth !

CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.*

Var. *sobolifera*, Del. thallus foliaceous, laciniae narrow, inciso-crenate, glaucous-green above, whitish beneath, podetia  $\frac{1}{2}$ – $\frac{3}{4}$  in. high, *cylindrical*, glabrous, subverrucose, sometimes leafy, *dilated upwards into a scyphus, whose margins are denticulato-dilated, subcymoso-proliferous with leaflets interspersed* ; apothecia small, simple, convex or conglomerate, fuscous.

Rocky mountains, probably not unfrequent, but confounded with *cervicornis*, from which the different reaction distinguishes it.

SYN :—Del. in Dub. Bot. Gall. 631. (1830) ; *Cladonia verticillata* b. *phyllophora*, Flk. Clad. 28 ! *Cladonia cervicornis* v. *prodiga*, Ach. L. U. 532.

FIG :—E. Bot. t. 1392. looks much more like this than *alcicornis*.

EXS :—Leight. 14. Mudd Brit. Clad. 2.

GEOG. DISTRIB :—Europe, N. & Tropical America, Africa, India.

BOT. PROV :—4, 5...7...10.

ENGLAND :—Yorkshire ! *Mr. Mudd.* Lound ! *Mr. D. Turner.* Caer Caradoc ! Wrekin ! Laurence Hill ! Shropshire.

IRELAND :—Ballyedmond, co. Cork ; *Mr. Wright.*

WALES :—Barmouth ! Holyhead Mountain !

11. *C. degenerans*, Flk. thallus squamulose ; podetia whitish or brown, cartilaginous, glabrous, *nigrescent* and *albo-guttate at the base*, scyphophorous, scyphi proliferous, cristato-ramose.

Heaths and mountains, rare.

SYN :—Flk. Clad. 41. (1828). Nyl. Syn. 199.

GEOG. DISTRIB :—Europe, N. America, Australasia, India.

BOT. PROV :—15...31.

SCOTLAND :—Craig Nick. *Mr. W. Gardner.*

CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.*

forma *anomæa*, (Ach.) podetia covered with leafy scales.

SYN :—Hook. Brit. 238. Scot. 63. Grev. Edin. 344.

FIG :—E. Bot. t. 1867.

BOT. PROV :—3, 4...14...23.

ENGLAND :—Woolwich Barn. *Sir J. E. Smith.* Lakenham. *Mr. Turner.*

SCOTLAND :—Pentland Hills, near Edinburgh. *Sir J. E. Smith.*

IRELAND :—Kelly's Glen. *Dr. Moore.*

12. *C. furcata*, Hoffm. thallus squamulose, evanescent; podetia elongated, pale whitish or brownish green, fruticose, glabrous, branched, branches attenuato-subulate, divergenti-furcate; apothecia small, fuscous.

Heaths and mountains, frequent.

Reaction distinguishes *furcata* from *pitagorus*.

SYN:—Hoffm. Fl. Germ. 115. (1795); Nyl. Syn. 1. 205; Hook. Brit. 236. Scot. 64; Mack. Hib. 80; Mudd Man. 57.

FIG:—Dill. t. xvi. f. 27. A. & C.

EXS:—Leight. 401. Mudd 16. Mudd Br. Clad. 50! 51! 53! (small form).

GEOG. DISTRIB:—Europe, N. & S. & Tropical America, India, Australasia.

BOT. PROV:—3, 4, 5...7, 8, 9, 10...14, 15.. 16 ..18, 19...31.

ENGLAND:—Yorkshire! *Mr. Mudd*. Kent! *Mr. R. S. Hill*. Leicestershire! *Rev. A. Bloom*. Lound Heath! *Mr. D. Turner*. Suffolk! *Sir W. J. Hooker*. Whitley Read, Cheshire! *Mr. W. Wilson*. Shotover Hill, Oxford. *Mr. Baxter*. Braxted, Essex. *Mr. Varenne*. Shropshire!

SCOTLAND:—Balmerino! Falls of the Garrawalt! Cairn-a-Drochell! White Hill! Forfarshire. *Mr. W. Gardner*. Moine! *Mr. Craill*. Hebrides; Arran. *Prof. Balfour*. Dunearn and Pentland Hills. *Dr. Greville*.

IRELAND:—Killarney. *Dr. Carrington*.

CHANNEL ISLANDS.—Guernsey. *Rev. T. Salway*. Jersey, Sark, &c. *Mr. Lorbalestier*.

Var. *racemosa*, Flk. podetia like those of the type, leafy or scaly.

FIG:—Dill. t. xvi. f. 27. B.

EXS:—Mudd Br. Clad. 46! 47!

LOCALITIES:—Yorkshire! *Mr. Mudd*. Ben Cruachan! *Mr. Barrer*. Killarney. *Dr. Carrington*. Pentland Hills. *Rev. J. Lightfoot*. North side of Orrock Hill. *Dr. Greville*. Channel Islands. *Mr. Lorbalestier*.

Var. *recurva*, Hoffm. podetia recurved, leafy.

SYN:—Mudd. Man. 58, Br. Clad. 22.

FIG:—Dill. t. xvi. f. 27 D.

EXS:—Mudd Br. Clad. 48! 49! 52!

LOCALITIES:—Yorkshire! *Mr. Mudd*. Leicestershire! *Rev. A. Bloom*. Near Beddgelart, N. Wales! *Mr. D. Turner*. Channel Islands. *Mr. Lorbalestier* Shropshire!

Var. *spinosa*, Flk. Hook. Brit. 236. *Cenomyce racemosa*, Hook. Scot. 64; Mack. Hib. 80.

FIG:—Dill. xvi. f. 25.

SCOTLAND.—Pentland Hills *Rev. J. Lightfoot*.

13. *C. crispata*, (Ach.) whitish, or pallido-cinerascent

or *subspadiceous*, basal leaflets small, incised and crenate ; *podetia* glabrous, branched, 3 or 4 times iterato-proliferous, *apices and axils infundibuliform*, open, the *apertures denticulato-cristate* at the margins.

In mountain ranges, very rare. 1869.

SYN :—Ach. Syn. 272. (1817). Nyl. Syn. 207. Crombie En. 20.

EXS :—Tuck. 31.

GEOG. DISTRIB :—N. Europe, N. America.

BOT. PROV :—15.

SCOTLAND :—Ben-a-boord. *Rev. J. M. Crombie*. (1869.)

14. *C. squamosa*, Hffm. thallus squamulose ; *podetia* caespitose, whitish green, cylindrical, 2in. high, erect, repeatedly branched, *poliferously denticulate*, or *subulate* from margins of the minute irregular scyphi, *apices rigid subcorymbose radiato-cristate*, glabrous, longitudinally sublacunose, *cortex entire, clothed with minute leaflets or scales* ; apothecia clustered, fuscous.

Mossy woods, not uncommon.

Distinguished from *delicata*, var. *subsquamosa* by different reaction ; from *pyxidata* v. *decorticata* by the *entire* cortex and the *podetia throughout clothed with scales* ; and from *furcata* f. *adspersa*, Flk. by different habit.

SYN :—Hffm. Fl. Germ. 125. (1795). Nyl. Syn. 209. (in part) ; a. & b. Mudd Man. 56 ; a. in part Mudd Br. Clad. 19 ; *Scyphophorus sparassus*, Hook. Brit. 237. (in part) ; *Cenomyce sparassa*, Hook. Scot. 64 (in part) ; Mack. Hib. 80. (in part).

FIG :—E. Bot. t. 2362.

EXS :—Mudd Br. Lich. 13 ! Brit. Clad. 40 ! 41 !

GEOG. DISTRIB :—Europe, N. and S. America, Africa, India, Australasia.

BOT. PROV :—5.. 7, 8...10, 11 ..15...19...31.

ENGLAND :—Charnwood Forest ! Leicestershire. *Rev. A. Bloxam*. (= *scabrosa* Ach ! in herb. D. Turner). Yorkshire ! *Mr. Mudd*. Hay Coppice, Herefordshire. *Rev. T. Salwey*. Northumberland and Durham. *Mr. Winch*.

SCOTLAND :—Siddlaw Hills and Glen Callater ! *Mr. W. Gardner*. Doune ! *Mr. Mc Kinlay*.

IRELAND :—Killarney ! *Mr. Drummond*.

WALES :—Hafod, Cardiganshire. *Sir J. E. Smith*. Lake above Llyn Bodlyn ! *Mr. Borrer*. Cwn Bychan. *Rev. T. Salwey*.

CHANNEL ISLANDS :—Guernsey, Jersey, Sark, &c. *Mr. Larbalestier*.

*B. Erythrocarpæ*, apothecia red.

Reaction (K f + C +)

15. *C. cornucopioides*, Fr. thallus squamulose, pale



yellow-green, crenate and crenato-incised ; podetia  $\frac{1}{2}$ —1 inch, *granuloso-verrucose*, glabrous or minutely squamulose, simple, dilated upwards into *cyathiform* simple or proliferous scyphi ; apothecia sessile or podicellate.

On earth &c., common.

In the typical form, the scyphi are short and broadly dilated, on short glabrous granuloso-verrucose podetia. In the *extensa* form, the podetia are much more elongated, and the scyphi proliferous from the margins ; and in the *phyllophora* form, the podetia and scyphi are entirely clothed with minute scales or leaflets. In the *pleurota* form, (which also presents the above 3 states) the cortex of the podetia deliquesces into a fine dust, probably from growing in humid localities.

The glabrous verrucose state is analogous to *C. pyxidata*, and the pleurota or pulverulent state to *fimbriata* among the phæocarpæ.

SYN :—Fr. L. E. 236. (1831) ; Nyl. Syn. 1. 220 ; *Scyphophorus cocciferus*, Hook. Brit. 240. *Cenomyce coccifera*, Hook. Scot. 63 ; Mack. Hib. 81. in part : *Cladonia coccifera* var. *cornucopioides*, A. & B. Mudd Man. 60. Brit. Clad. 28.

FIG :—E. Bot. t. 2051. Laur. in Sturm D. Fl. t. 23. a. and 25. (typica.)—t. 23. b. and c. (*extensa*)—t. 24. e. (*phyllophora*).

EXS :—(typica). Mudd Br. Clad. 65 ! Anzi Clad. Cisalp. 14. A.—(*extensa*) M. & N. 752 ! Mudd Br. Clad. 66 !—(*phyllophora*) Anzi Clad. Cisalp. 14. B !—(*pleurota* typica). Anzi Clad. Cis. 15 ! (*extensa*). Tuck. L. Am. Sept. 37 !—(*phyllophora*). Leight. 375 !

GEOG. DISTRIB :—Europe, N. & S. America, India, Australasia.

BOT. PROV :—3, 4, 5, 6...7, 8...10, 11...15...18, 19...31.

ENGLAND :—Shotover Wood ; Bagley Wood, Berks ! *Mr. Baxter*. Yorkshire ! *Mr. Mudd*. Charnwood Forest ! Leicestershire. *Rev. A. Bloxam*. Basingstoke ! Kent. *Mr. R. S. Hill*. Rye-loaf Hill, near Settle. *Dr. Windsor*. Ampthill, Beds. *Rev. C. Abbot*. Northumberland and Durham. *Mr. Winch*. Bromsgrove Lickey ; Ridgway ; Malvern Hills, Worcestershire. *Mr. Purton*. Caer Caradoc ! Wrekin ! Long Mynd ! Stiperstones ! Shropshire.

SCOTLAND :—Ben-na-Bourd and Braemar ! Sidlaw Hills and White Hills ! Forfarshire. *Mr. W. Gardner*. Cawdor Wood ! Nairn. *Mr. Croall*. Selchallion ! *Sir W. J. Hooker*. Doune ! *Mr. Mc Kinlay*. Ben Ferrog ! *Mr. Borrer*. Callernish. *Dr. Lindsay*.

IRELAND :—Mangerton Mountain and Killarney ! *Sir T. Gage*. Killarney. *Dr. Carrington*.

WALES :—Aberdovey ! *Rev. A. Bloxam*. Barmouth !

CHANNEL ISLANDS :—Portalat Bay, Jersey. *Mr. Larchestier*.

16, *C. vestita*, Ach. thallus foliaceo-squamulose ; podetia 1—2 $\frac{1}{2}$  inches high, *flavescent*, cylindrical, simple, corticate, glabrous, *cortex breaking into adnate or scabrous portions or verrucæ, which eventually become crenate*

*squamules*; scyphi cylindrical, narrow, simple, or shortly proliferously divided; apothecia conglomerate.

Mountains, rare.

No doubt confounded with *bellidiflora*, which it much resembles, but distinct by different reaction.

SYN:—Ach. L. U. 541. (1810).

FIG:—Dill. xv. fig. 15. B. as to general form, but not colour of apothecia.

Exs:—Th. M. Fr. L. Sc. 12! Anzi Clad. Cis. 16. A! Mass. 173! Schær. 40!

GEOG. DISTRIB:—N. America.

BOT. PROV:—15.

SCOTLAND:—Ben Ferrog! Mr. Borrer. Aberdeen! Ben-na-Bourd, Braemar! Mr. W. Gardner.

17. *C. deformis*, Hffm. thallus foliaceous, leaflets pale green, inciso-crenate, whitish beneath; podetia 1—3 inches, leafless, tubular, sulphureo-pulverulent, turgid, simple, scyphiferous, scyphi regular or deformed, margins erect, crenato-dentate.

Shady woods, rare.

The podetia are cylindrical, leafless, thickened upwards, or sometimes turgid and narrowed under the scyphus, and are either entirely pulverulent, or corticate at the base, pulverulent above.

SYN:—Hffm. Fl. Germ. 120. (1795); Nyl. Syn. 1. 222; *Scyphophorus deformis*, Hook. Brit. 240; *Cenomyce deformis*, Hook. Scot. 63; *Cladonia coccifera* v. *deformis*, Mudd Man. 61. v. *deformis* α, Mudd Brit. Clad. 30.

FIG:—E. Bot. t. 1394; Dill. t. xv. f. 18. A.

Exs:—Bohl. 29. Mudd 25. Schær. 47. 48. 49.

GEOG. DISTRIB:—Europe, N. & S. America, India, Australasia.

BOT. PROV:—2...5...10, 11, 12...14, 15, 16.. 23.

ENGLAND:—Yorkshire! Mr. Mudd. Westmoreland! Mr. Robertson. Amberley Wild Brook, Sussex! Mr. Jenner. Hay Coppice, Herefordshire. Rev. T. Salwey. Northumberland and Durham. Mr. Winch.

SCOTLAND:—Appin. Capt. Carmichael. Ben-na-Bourd and Braemar! Mr. Croall. Pentland Hills. Dr. Greville. Ben Ferrog! Mr. Borrer. Glen Callater and Linn of Dee! Aberdeen. Mr. W. Gardner.

IRELAND:—Howth. Dr. Moore.

### \*\* Reaction, (K + C—)

18. *C. digitata*, Hffm. thallus foliaceous at base, leaves small, lobato-crenate, pale green above, white beneath; podetia ochroleuco-pulverulent, cylindrical, 1—

2 inches, simple, scyphi narrow, *margin digitato-dentate incurved*, or dilated and proliferous.

Mossy woods, rare.

Podetia sometimes corticate at the base, pulverulent above, sometimes entirely pulverulent, either leafless, or often with a few scattered leaflets, or sometimes leafy at the base, the leaflets diminishing in size upwards.

Reaction, colour, and incurved margins of scyphi distinguish this from *deformis*.

SYN:—Hffm. Fl. Germ. 124. (1795); Nyl. Syn. 1. 222; *Scyphophorus digitatus* (in part). Hook. Brit. 240; *Cenomyce digitata*, Hook. Scot. 63; *Cladonia coccifera*  $\epsilon$  &  $\zeta$  *digitata*, Mudd Man. 61. Br. Clad. 31.

FIG:—Laur. in Sturm D. Fl. t. 15. 16.

EXS:—Schær. 44! 46!; Nyl. 25!

GEOG. DISTRIB.—N. America, Australasia.

BOT. PROV:—5...8...14, 15, 16..23.

ENGLAND:—Leicestershire! *Rev. A. Bloxam*. Wallington! *Sir W. C. Trevelyan*. Shropshire! *Rev. T. Salwey*. Oversley Wood. *Mr. Purton*.

SCOTLAND:—Craig Koynoch! *Mr. W. Gardner*. Arran. *Prof. Balfour*. Pentland Hills. *Dr. Greville*.

IRELAND:—Kelly's Glen. *Dr. Moore*.

CHANNEL ISLANDS:—Jersey. *Mr. Larbalestier*.

Mudd in his Manual, cites to his *digitata* E. Bot. t. 1836, which if it were not described as having *scarlet* apothecia, I should refer to some form of *furcata*. Certainly it does not represent the typical *digitata*, nor does E. Bot. t. 2439, which Hooker quotes as illustrative of *digitata*, but rather represents var. *macilenta* f. *polypylactyla*. Mudd's specimens, 68, 69, 70, in his Br. Clad. from the incano-pulverulent colour approach *macilenta*.

Var. \* *macilenta*. Hffm. thallus foliaceous or squamulose; podetia *incano-granuloso-pulverulent*, cylindrical,  $\frac{1}{2}$ —lin. high, slender, *simple*, sometimes shortly *divided at the apex, ascyphous*; apothecia terminal, tuberculose.

Mountainous turfy heaths, not unfrequent.

SYN:—Hffm. Fl. Germ. 126. p. p. (1795); Nyl. Syn. 1. 223. *Scyphophorus filiformis*, Hook. Brit. 239. *Cenomyce filiformis*, Hook. Scot. 63; Mack. Hib. 82; *Cladonia coccifera*  $\eta$  Mudd Man. 61. *Cladonia coccifera*  $\epsilon$  *macilenta*, Mudd Br. Clad. 31.

FIG:—E. Bot. t. 2028.

EXS:—Schær. 33! 34! M. & N. 750! Hepp. 113! Anzi Clad. Cis. 19. B. C. ! Mudd L. Br. 29!

GEOG. DISTRIB:—Europe, N. America, Australasia.

BOT. PROV:—2...5...8...10, 11...14, 15..19.

ENGLAND:—Yorkshire! *Mr. Mudd*. Leicestershire! *Rev. A. Floxam*. New Forest, Hants. *Mr. Lyell*. Edgefield! *Sir W. J. Hooker*. Cromford Moor, near Matlock. *Sir J. E. Smith*. North-

umberland and Durham. *Mr. Winch.* Braxted Park Wall, Essex.  
*Mr. Varenne.* Wrekin ! Shropshire.

SCOTLAND :—Pentland Hills. *Sir J. E. Smith.* Campsie ! *Mr. Mc Kinlay.*

IRELAND :—Dunkerron. *Dr. Taylor.* Bantry. *Miss Hutchins.*  
Killarney. *Mr. Carroll.*

CHANNEL ISLANDS :—Jersey, *Mr. Larbalestier.*

*f. clavata*, (Ach.) podetia white, subventricos-cornute,  
sterile.

SYN :—Ach. Syn. 267. (1817).

EXS :—Schær. 75. Leight. 275 ! 297 ! 403 !

GEOG. DISTRIB :—Europe.

BOT. PROV :—1, 2...5...7, 8.

ENGLAND :—Leicestershire ! *Rev. A. Bloxam.* Kynance Cove !  
Cornwall ; Blackland Common, Henfield ! Sussex. *Mr. Borrer.*  
Nesseliffe ! Long Mynd ! Wrekin ! and Laurence Hills ! Shropshire.

WALES :—Barmouth !

*f. polydactyla*, Flk. podetia scyphiferous, scyphi digi-  
tato-cristate.

SYN :—Mudd Man. 62. (1861).

FIG :—E. Bot. t. 2437.

EXS :—Schær. 454. Leight. 174. Mudd 27, 28. Br. Clad. 77.  
78.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2.. 7, 8...10...12, 13 ..15...19.. 31.

ENGLAND :—Westmoreland ! *Mrs. Stanger.* Burton Mill Pond !  
Amberley Wild Nook ! Sussex. *Mr. Jenner.* Kynance Cove, Corn-  
wall ! *Mr. Borrer.* Yorkshire. *Mr. Mudd.* Leicestershire. *Rev. A.*  
*Bloxam.*

SCOTLAND :—Carr Hill ! Linn of Dee ! *Mr. W. Gardner.* Loch  
Minch, Aberdeen ! *Mr. Croall.* Kirkmichael, Dumfriesshire. *Mr.*  
*Mc Garroch.*

IRELAND :—Bantry ! *Miss Hutchins.*

WALES :—Moel-y-Golfa ! Montgomeryshire.

CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.*

*f. carcata*, Ach. podetia leafy and squamulose.

SYN :—Ach. L. U. 568. (1810). Syn. 266.

EXS :—Mudd Br. L. 23. Br. Clad. 72, 79.

GEOG. DISTRIB :—Europe.

BOT. PROV :—5...7 ..12...15...19...31.

ENGLAND :—Westmoreland ! *Mrs. Stanger.* Lyth Hill ! Shrop-  
shire.

SCOTLAND :—Craig-y-Barns, Dunkeld ! *Dr. Lindsay.*

IRELAND :—Killarney Hill. *Dr. Moore.*

WALES :—Moel-y-Golfa ! Montgomeryshire.

CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.*

*f. ostreatiformis*, thalline leaves adscending and imbri-

cate, rotundate, thickened and pulverulent at the margins, green above, white pulverulent beneath; podetia similar to those of *clavata*.

FIG :—Can. E. Bot. t. 2112. be. this?

Exs :—Leight. 371. Mudd Br. Clad. 69.

GEOG. DISTRIB :—Europe.

BOT. PROV :—5...10.

ENGLAND:—Yorkshire! *Mr. Mudd*. Laurence Hill! Shropshire.

Passing insensibly into *digitata*. Similar in general appearance to *C. bacillaris*, but distinct by different reaction.

### \*\*\* Reaction, (K—C—)

19. *C. Florkeana*, Fr. thallus squamulose, evanescent; podetia 1—1½ inch, white or brown, cylindrical, slender, cartilaginous, *glabrous*, *continuously corticate*, *verruculose* or *squamoso-decorticate*, *nigrescent at the base*, *scales and granules innate*, apex thickened, obsoletely scyphiferous and shortly divided; apothecia conglomerate.

Mountainous heaths, rare.

SYN :—Fr. L. E. 238. (1831). Nyl. Syn. 1. 225. Flk. Clad. 99; *Cladonia corcifera* v. *Florkeana*, Mudd Man. 61. (in part). Br. Clad. 33. (in part).

FIG :—Laur. in Sturm D. Fl. t. 14. f. a. d.

Exs :—T. M. Fr. Lich. Scand 13. (in part).

GEOG. DISTRIB :—N. America, Australasia.

BOT. PROV :—10.. 15...19, 20.

ENGLAND :—Yorkshire! *Mr. G. Dixon*.

SCOTLAND :—Ben-a-Bourd! *Mr. W. Gardner*.

IRELAND :—Doneraile Mountains, co. Cork. *Mr. Carroll*. Killarney. *Dr. Carrington*.

Var.\* *bacillaris*, Ach. similar to *Florkeana* in general characters, but the cortex deliquesces into a granular ashey-grey or a fine white impalpable powder, or the granules are developed into minute leafy scales, which more or less entirely cover the podetia.

Mountainous heaths, not unfrequent.

Hitherto confused by external aspect and characters alone with *C. macilenta*, but separated by different reaction. Analogous to *Florkeana*, as *pleurota* to *cornucopioides* and *fimbriata* to *pyridata*.

SYN :—Var.\* *bacillaris*, Ach. and auct. pro. max. p.; Leight. in Ann. and Mag. N. H. Nov. 1866.

Exs :—Schar. 36. 37. 56. Mudd Br. L. 24. Br. Clad. 70. 71. 73.

GEOG. DISTRIB :—Europe, N. Tropical and S. America, India, Australasia.

BOT. PROV :—2...5 ..7, 8...10.. 15...19.. 31.



ENGLAND :—Yorkshire ! *Mr. Mudd.* Leicestershire ! *Rev. A. Bloxam.* Basingstoke ! *Mr. R. S. Hill.* Long Mynd ! Stiperstones ! Wrekin ! Laurence ! Caradoc ! Abdon Burf ! Craigforda ! Shropshire.

SCOTLAND :—Aberdeen ! Ben-na-Bourd ! *Mr. Croall.* Sidlaw Hills ! and Cairn-a-Drochel ! *Mr. W. Gardner.*

IRELAND :—Ireland ! *Miss Hutchins & Sir T. Gage.*

WALES :—Barmouth !

CHANNEL ISLANDS :—Jersey, *Mr. Larbalestier.*

20. *C. bellidiflora*, Schær. thallus folioso-squamaceous ; podetia *flavescent*, 1—2 inches, elongated, glabrous, cylindrical, *simple*, verrucoso-scabrous or *foliaceo-squamulose*, *scyphi* narrow, sometimes divided ; apothecia conglomerate.

Lofty mountains, very rare.

Distinct by reaction from *vestita* (K f + C +) with which it has been hitherto confounded.

SYN :—Schær. Spicil. 21. (in part) Nyl. Syn. 221. (in part) : *Scyphophorus bellidiflorus*, Hook. Brit. 240 ; *Cenomyce bellidiflora*, Hook. Scot. 64 ; Mack. Hib. 82 ; *Cladonia coccifera* B. *bellidiflora*, Mudd Man. 60. Br. Clad. 29. (in part).

FIG :—E. Bot. t. 1894.

EXS :—Schær. 42. Anzi Clad. Cis. 16 B. !

GEOG. DISTRIB :—Europe, N. America.

BOT. PROV :—1...7...11..14, 15, 16...23...30.

ENGLAND :—Lustleigh Cleve, Devon. *Mr. Parfitt.* Prestwick Carr ; Hexham and Dilston Fells ; Cheviot, Northumberland ; Teesdale and Weardale, Durham. *Mr. Winch.*

SCOTLAND :—Ben Nevis ! *Messrs Turner & Hooker.* Ben Lawers ! Ben Lomond ! Cairn Gorum ! *Sir W. J. Hooker.* Craig Chail-leach ! *Mr. D. Turner.* Ben Ferrog ! Ben Cruachan ! *Mr. Borrer.* Arran. *Prof. Balfour.* Pentland Hills. *Dr. Greville.* Lothnagar ! Aberdeen ! Cawdor Wood ! Nairn ! and Braemar ! *Mr. Croall.*

IRELAND :—Near Belfast. *Mr. Templeton.* Kelly's Glen, Dublin. *Dr. Moore.*

WALES :—Diffwys, near Barmouth. *Rev. T. Salwey.*

### SUB-GENUS 3. CLADINA. *Nyl.*

Thallus leafless ; podetia without scyphi, repeatedly branched, more or less smooth ; apothecia terminal, biatorine, pale or red.

A. *Phaeocarpæ*, apothecia pale or fuscous.

\* *Reaction* (K f + C +)

1. *C. sylvatica*, Hffm. podetia 2—6 inches high.

*white or pale straw-coloured glabrous, branched, terminal branches radiato-cymose, fastigiata, apices subsecund nodding.*

Hills, mountains, heaths, &c, probably not uncommon.

Separated from *rangiferina* by the above characters and different reaction.

SYN:—*C. sylvatica*, Hoffm. Fl. Germ. 114. (1795). Nyl. Syn.

1. 212. *C. rangiferina* B. *sylvatica*, Mudd Man. 59. Br. Clad. 25. Exs:—Coëm. Clad. Belg. 158. 159. Leight. 57.

GEOG. DISTRIB:—Europe, N. & S. America, India, Australasia.

BOT. PROV:—14, 15...19.

SCOTLAND:—Pentland Hills! *Dr. Greville*. Deerhill Wood! Sands of Barrie! *Mr. W. Gardiner*. Callander! *Mr. Mc Kinlay*.

IRELAND:—Killarney. *Dr. Carrington*.

*f. scabrosa*, podetia scabrous, with minute whitish irregular points or verrucæ.

Exs:—Mudd Br. Clad. 57. 60.

In similar situations with type, but differences owing probably to age or climate.

ENGLAND:—Leicestershire! *Rev. A. Bloxam*. Basingstoke, Kent! *Mr. R. S. Hill*. Yorkshire! *Mr. J. G. Baker*. Long Mynd! Shomere Moss! Shropshire.

*f. alpestris*, Linn. podetia *white or pale straw-coloured, verrucose, intricately and divaricately branched, densely thyrsoïd at the apex.*

Similar habitats with type; rare.

SYN:—*f. alpestris*, Linn. Sp. Pl. 1620. Nyl. Syn. 1. 212; *Cladonia rangiferina* v. *alpestris*, Mudd Man.; Br. Clad.

FIG:—Dill. t. xvi. f. 29. E. F.

Exs:—M. & N. 1063!

GEOG. DISTRIB:—N. Tropical and S. America, Australasia.

BOT. PROV:—1.. 15...23.

ENGLAND:—Near Exeter. *Mr. Parfitt*.

SCOTLAND:—Grampians. *Rev. J. M. Crombie*.

IRELAND:—Ballytore, Kildare! *Mr. Carroll*.

*f. portentosa*, Duf. podetia very thick and turgid. *verrucoso-leprous, branches short, turgescens, apices denticulato-cristate.*

SYN:—Duf. Revis. 29. (1818). Nyl. Syn. 212.

Exs:—Coëm. Clad. Belg. 164. 165.

BOT. PROV:—8.

ENGLAND:—Leicestershire! *Rev. A. Bloxam*.

*f. pumila*, Ach. densely caespitoso-pulvinular.

SYN:—Ach. L. U. 566. (1810). Syn. 278.

GEOG. DISTRIB:—N. & S. America, Africa, Polynesia, Australasia.

ENGLAND:—Leicestershire ! *Rev. A. Bloxam*. Nesseliffe, Shropshire !

2. *C. amaurocrea*, (Flk.) straw-coloured or whitish-straw-coloured, cefoliolose ; *podetia* glabrous or slightly squamoso-decorticate, straight, subulate and slender, much branched, some scyphiiferous, *scyphi* cupuliform, *dentato-cristate* or subulato-spinose, often proliferous.

In sub-alpine regions, very rare. 1869.

SYN :—Flk. Clad. 119. (1828). Nyl. Syn. 216, Crombie En. 22.

EXS:—Fellm. 41. Fries. 347.

GEOG. DISTRIB:—Northernmost parts of Europe, Asia, America, and Australasia.

BOT. PROV:—15.

SCOTLAND:—County of Aberdeen. *Rev. J. M. Crombie*. (1869).

### \*\* Reaction, ( $K + C$ —)

3. *C. rangiferina*, Hoffm. *podetia* 2—6 inches high, cinerascens, verruculoso-scabrous, subtomentose, branched, terminal branches subcorymbose, fastigiate, apices subsecund, nodding.

Hills, mountains, heaths, common.

Distinguished from *sylvatica* by the above characters and different reaction.

SYN:—*C. rangiferina*, Hoffm. Fl. Germ. 114. (1795). Nyl. Syn. 211 ; Hook. Brit. 235 ; Mudd Man. a. 58. Br. Clad. a. b. c. 25 ; *Cenomyce rangiferina*, Hook. Scot. 65. Mack. Hib. 79.

FIG:—E. Bot. t. 173. Dill. xvi. f. 29. A. B.

EXS:—Schær 76. (f. gracilis), 77. (f. grandis,) Coëm. Clad. Belg. 140. 146.

GEOG. DISTRIB:—Europe, N. & S. America, Asia, Africa, India.

BOT. PROV:—1...4...10...13, 14, 15, 16...18...31.

ENGLAND:—Yorkshire ! *Mr. Mudd*. Dartmoor. *Mr. Parfitt*. Peart's Crags ; near Park House, Settle, Yorkshire. *Dr. Windsor*. Bedfordshire. *Rev. C. Abbot*. Tiptree Heath, Essex. *Mr. Varanne*. Shropshire !

SCOTLAND:—S. of Barrie ! Summit of Lion's Face ! *Mr. W. Gardiner*. Glen Carlater ! Braemar ! *Dr. Lindsay*. Craig Keynoeh ! *Mr. Croall*. Hebrides ; Arran ; Long Island. *Prof. Balfour*. Hartfell, Moffat. *Dr. Nichol*. Pentland Hills, *Dr. Greville*.

IRELAND:—on heaths and mountains, common ; *Mr. Carroll*.

CHANNEL ISLANDS:—Guernsey. *Rev. T. Salway*. Jersey ; Sark ; Herm ; Jethou, &c. *Mr. Larbalestier*.

### \*\*\* Reaction, ( $K - C +$ )

4. *C. ...*, Hoffm. *podetia* ...

*glabrous*, cylindrical, *fistulose*, dichotomous, branches short, *apices subulate denticulate or digitate*.

Heaths and moors, common.

SYN:—*C. uncialis*. Hoffm. Fl. Germ. 117. (1795), Nyl. Syn. 1. 215. Hook. Brit. 235; Mudd Man. 59; *Cenomyce uncialis*, Hook. Scot. 64. Mack. Hib. 79. *Cladonia stellata a. uncialis*. Mudd Brit. Clad.

FIG:—E. Bot. t. 174.

EXS:—Schær. 82. Leight. 58.

GEOG. DISTRIB:—Europe, N. America.

BOT. PROV:—1...4, 5...7, 8...10, 11...15, 16...18...20.

ENGLAND:—Yarmouth! Mr. D. Turner. Leicestershire. Rev. A. Blizard. Dartmoor. Mr. Parfitt. Malham Tarn, near Settle. Dr. Windsor. Amptill, Beds. Rev. C. Abbot. Northumberland and Durham. Mr. Winch. Bromsgrove Lickey, Worcestershire. Mr. Purton. Shropshire!

SCOTLAND:—Ben Mc Dhu, Braemar! Dr. Lindsay. Hartfell, Moffat. Dr. Nichol. Hebrides; Arran. Prof. Balfour.

IRELAND:—Coachford! co. Cork. Mr. Carroll.

WALES:—Llyn-y-Cwm Bychan! near Barmouth. Mr. Borrer.

*f. turgescens*, Fr. podetia thickened and turgid upwards, apices dilated, denticulato-stellate.

Heaths and mountains, rare.

SYN:—*C. turgescens*, Fries L. E. 244. (1831). Mudd Man. 59; *Cladonia stellata b. turgescens*, Mudd Man. Clad. 27.

EXS:—Schær. 84.

GEOG. DISTRIB:—Europe.

BOT. PROV:—2...15.

ENGLAND:—Hants! Mr. R. S. Hill.

SCOTLAND:—Ben Lawers; Ben Voirlich. Dr. Greville. Hill of Ardo, near Aberdeen! Rev. J. M. Crombie.

*f. adunca*, (Ach.) podetia elongated, somewhat turgid, branches hooked.

Similar situations with type, not uncommon.

SYN:—*f. adunca* (Ach.) Hook. Scot. 64; *Cladonia stellata B. elatior*, Mudd Man. 59; *Cladonia stellata B. adunca*. Mudd Br. Clad. 26.

FIG:—Dill. XVI. f. 21 A.B.

EXS:—Schær. 513. 514. Mudd L. Br. 21! Br. Clad. 62!

GEOG. DISTRIB:—Europe.

BOT. PROV:—2...10, 11...15...20.

ENGLAND:—Hants! Mr. R. S. Hill. Yorkshire! Mr. Dixon. Cheviot; Teesdale. Mr. Winch.

SCOTLAND:—Ben Nevis! Dr. Lindley. Summit of Bassier, Clova!; Sillaw Hills! Forth. Mr. W. Gardner.

IRELAND:—Doneraul Mountain, co. Cork. Mr. Carroll.

Dr. Taylor in Mack. Hib. 79. mentions a var. *attenuata* gathered

by Mr. Templeton on the side of Devis Mountains, to which he quotes Dill. xvi. f. 22. II. and thus characterizes ; thallus of minute lobed basal scales ; podetia brown, subdivided at the summits, beset with minute scales. Whatever this may prove on inspection of the specimens, it certainly does not belong to this sub-genus *Cladina*.

## II. PILOPHORON. *Tuck.*

Thallus subsquamaceo-granulose. Podetium rigid, cylindrical, simple, or branched upwards, granulate. Apothecia nigro-rufous, capituliform, subglobose. Spores 8, colourless, ellipsoid, or oblongo-ellipsoid, simple. Sterigmata simple. Spermatia cylindrical, curved or straight.

1. *P. fibula*, Tuck. whitish, subsquamaceo-granulate, conrescenti-areolate, appressed ; podetia solid, erect, terete, very short, simple, subsquamaceo-granulate ; apothecia subglobose, depressed ; spores 8, colourless, ellipsoid, or ellipsoideo-fusiform ; cephalodia thalline, fusco-nigricant, minutely tuberculose.

On perpendicular wet rocks, rare.

SYN:—*P. fibula*, Tuck. Syn. Lich. N. Amer. p. 46. (1845).

FIG:—Th. M. Fries Mon. Ster. & Pil. t. 10. f. 5. Nyl. Syn. t. 7. f. 6.

GEOG. DISTRIB:—N. America.

BOT. PROV:—7.

WALES:—Llyn Cae ! Llyn Aran ! and the Giant's Pebbles ! Cader Idris ! Arran Mowddy ! Pass of Llanberis ! Snowdon.

## TRIBE V. STEREOCAULEI.

Thallus generally cæspitose, formed of podetia with a solid cartilaginous medullary axis, around which the white exterior fragile granulose portions of the thallus are congregated. Apothecia terminal or lateral, lecidine, nigricant or fuscous.

### I. STEREOCAULON. *Schreb.*

Podetia covered with fragile granules of various forms. Apothecia fuscous or fusco-pallescent. Spores cylindraceo-fusiform, with few or many septa, (3—9). Sterigmata simple. Spermatia aciculari-bacillar, straight, or slightly curved.



1. *S. coralloides*, Fr. caespitose, ramoso, *glabrous*, granules cinerascens, *subfibrillose or digitato-divided*; apothecia terminal and lateral; spores cylindracco-fusiform, 3-septate; cephalodia cinerascens, verrucose, minutely granulate, sessile.

On rocks, common.

SYN:—*S. coralloides*, Fr. Sched. Crit. 4. p. 24. (1824). Nyl. Scand. 63.

FIG:—Nyl. Syn. t. 7. f. 16. Schær. En. t. 6, f. 5.

EXS.—Tuck. 91. Schar. 261. Hepp 114. M. & N. 73. Leight. 148. Mass. 44. Anzi It. S. 28.

GEOG. DISTRIB.—N. Europe, N. Asia, N. America.

BOT. PROV:—1 ..7...10, 11 ..13, 14, 15, 16...19.

ENGLAND:—Teesdale, Durham. *Rev. J. Harriman*. Baysdale Moor! Cleveland. *Mr. Mudd*. Dartmoor. *Dr. Holl*.

SCOTLAND:—Caerlaverock Wood! Dumfries; and Isle of Skye. *Dr. Lindsay*. Pentland Hills. *Dr. Greville*. Sidlaw Hills; Balgay; Clova; Canlochen. *Mr. W. Gardiner*. Grampians. *Rev. J. M. Crombie*. Ben Lawers. *Dr. Holl*.

IRELAND:—Killarney. *Dr. Carrington*. Conner Cliffs, near Dingle; on Caher McGillicuddy's Reeks; Blackwater Bridge, Kerry. *Mr. Carroll*.

WALES:—Cader Idris. *Dr. Holl*. Barmouth!

2. *S. paschale*, (Ach.) *densely stipate, ascending, nearly glabrous*, granules albo-cinerascens or *whitish, crenate*; apothecia terminal; spores fusiformi-cylindrical, 3-(sometimes 5—9)-septate; cephalodia verrucose, cinerascens, sessile.

On rocks, common. 1724.

SYN:—*S. paschale*, Ach. Meth. 315. (1803). Nyl. Scand. 64.

FIG:—E. Bot. 282. Nyl. Syn. t. 7. f. 18—28.

EXS:—Tuck. 112. Hepp 304.

GEOG. DISTRIB:—Europe, Asia, N. America, Ceylon.

BOT. PROV:—1, 2...5, 7, 8 .10, 11, 12, 13, 14, 15...18, 19...26.

ENGLAND:—Cumberland! *Mrs. Stanger*. Oswestry! Shropshire. *Rev. T. Salway*. York. *Mr. Dixon*. Teesdale. *Sir W. C. Trevelyan*. Kielder, Northumberland. *Prof. Balfour*. Sussex. *Mr. Hemmings*. Falcon Clints, Teesdale. *Mr. Mudd*, between Lestwithiel and St. Austle, Cornwall. *Messes. Turner & Sowerby*, near Ambleside. *Sir J. E. Smith*. Dartmoor, Devon. *Mr. Newberry*. Northumberland and Durham. *Mr. Winch*. Blackstone Rock, Devon. *Mr. Parfitt*. Black Edge, near Buxton. *Dr. Holl*. Pophills, near Leicester. *Mr. Purton*. Abdon Burf! Shropshire.

SCOTLAND:—Hill east of Glen Callater! Braemar; Caerlaverock, Dumfries; and opposite Birnam, Dunkeld. *Dr. Lindsay*. Lachnaduff, Berwickshire. *Sir W. C. Trevelyan*. Strathmartin,

Forfarshire. *Mr. W. Gardiner*. Callernish, Lewis. *Dr. Lindsay*.

IRELAND :—Connemara! co. Galway. *Dr. Moore*. Killarney. *Dr. Carrington*. Conner Cliff, Dingle. *Mr. Carroll*.

WALES :—Cader. Idris and Snowdon; *Dilleni*us. Craig Breiddin! Montgomeryshire

3. *S. tomentosum*, Fr. podetia *densely arachnoideo-tomentose, whitish, divaricato-ramose, granules albido-cinerascent, crowded, rounded or crenate*; apothecia terminal and lateral; spores fusiformi-bacillar, 3,- (rarely 5-7-) septate.

On rocks, rare.

SYN :—*S. tomentosum*, Fr. Sched. Crit. 3. p. 20. (1824). Nyl. Scand. 64.

EXS :—Tuck. 23. Schær. 262. 264. Hepp 302. Anzi Ven. 19.

GEOG. DISTRIB :—Europe, Asia, Peru, N. & S. America.

BOT. PROV :—10...15.

ENGLAND :—Yorkshire. *Mr. Dixon*.

SCOTLAND :—South Ferry Links, Fifeshire! *Dr. Ogilvie*. Sands of Barrie; Head of Canlochen, Forfarshire. *Mr. W. Gardiner*. Ben Lawers! *Dr. Lindsay*. Grampians. *Rev. J. M. Crombie*.

Var. *alpinum*, Laur. podetia less tomentose, granules whitish, turgid, verrucoso-conglomerate.

On rocks.

SYN :—*S. alpinum*, Laur. Fr. L. E. p. 204. (1831). Nyl. Scand. 64.

EXS :—Schær. 263. Hepp 303.

GEOG. DISTRIB :—Europe, Asia.

BOT. PROV :—12...15...26.

ENGLAND :—Cumberland! *Mrs. Stanger*.

SCOTLAND :—Ben Lawers. *Dr. Holl*.

IRELAND :—Connemara. *Dr. Moore*.

Var. *botryosum*, Ach. podetia glabrous, granules thyrsoideo-conglomerate on the extremities of the branches.

On rocks.

SYN :—Ach. L. U. 581. (1810). Nyl. Scand. 64.

EXS :—Schær. 264.

GEOG. DISTRIB :—Switzerland, Scandinavia.

BOT. PROV :—10.

ENGLAND :—Teesdale. *Mr. Mudd*.

4. *S. denudatum*, Flk. podetia slender, simple or branched, *attenuate at the apex, glabrous, granules whitish, or albo-cinerascent, subpeltate, medio-depressed, margin white crenulate*; apothecia fuscous, small, plane or convex, terminal or lateral; spores elongato-fusiform,

3-(rarely 5—7-) septate; cephalodia olivaceo-fuscescent, verrucoso-glomerulose.

On rocks, not uncommon.

SYN :—*S. denudatum*, Flk. D. L. 79. (1815). Nyl. Scand. 65.

FIG :—Nyl. Syn. t. 7. f. 29.

EXS :—M. & N. 466. Fr. 546. Anzi Langob. 15.

GEOG. DISTRIB :—Europe, Asia, America.

BOT. PROV :—1...5...7...10, 11...15...18, 19, 20...26...30.

ENGLAND :—Dartmoor. *Dr. Holl.* Battersby Moor ! Yorkshire. *Mr. Mudd.* Teesdale, Durham. *Mr. Baker.* Clee Hill ; Mynydd-y-Myfyr, Shropshire. *Rev. T. Salwey.*

SCOTLAND :—Aumbre ! Perthshire ; Caerlaverock Wood ! Dumfries ; Ben Mac Dhiu, Braemar ! (4294. ft.) ; Ben Nevis ! *Dr. Lindsay.* Ben Lawers ! (4406. ft.) *Dr. Gilchrist.* Siddaw Hills and Clova. *Mr. W. Gardiner.* Long Island. *Prof. Balfour.* Grampians. *Rev. J. M. Crombie.*

IRELAND :—Connemara ! and co. Antrim ; Killarney. *Dr. Moore.* Gongaumbarra, Cork. *Mr. Carroll.*

WALES :—Llyn Aran ! Llyn Cae ! Cader Idris ! Arran Mowddy ! Pass of Llanberis ! Snowdon.

5. *S. condensatum*, Hoffm. very small, podetia very short, strong, simple, naked, granules whitish or cinerascens, nodulose, crenulate, condensed into a lax-granulose crust ; apothecia fuscous, sessile ; spores fusiform or cylindracco-fusiform, 3—7-septate.

On the earth and rocks, rare.

SYN :—*S. condensatum*, Hoffm. Fl. Germ. p. 130. (1795). Nyl. Scand. 65.

FIG :—Nyl. Syn. t. 7. f. 81.

EXS :—Schær. 509 Mudd 33. Anzi It. S. 29. Mass. 181. Th. Fr. 64.

GEOG. DISTRIB :—Europe, N. America, Java.

BOT. PROV :—1.. 5...7...10, 11...15...19.

ENGLAND :—Battersby Moor ; ! Ayton Moor ! Cleveland. *Mr. Mudd.* Sweeney ! Shropshire. *Rev. T. Salwey.* Teesdale, Durham. *Rev. J. Harriman.* Budleigh Salterton, Devon. *Dr. Dickie.* Abdon Burf ! Shropshire.

SCOTLAND :—Aumbrey ! Perthshire. *Dr. Lindsay.* Auchterhouse and Bolkernnock, Forfarshire. *Mr. Gardiner.* Castleton, Braemar. *Adm. Jones.*

IRELAND :—Mangerton, Killarney. *Mr. Carroll.*

WALES :—Moel-y-Golfa ! Montgomeryshire.

CHANNEL ISLANDS :—La Moie, Jersey ; Tortavel, Guernsey. *Mr. Larbalestier.*

Var. *cereolinum*, Ach. thallus closely affixed to the rock ; podetia slender, glabrous, often sorediiferous at

the apices; cephalodia verrucoso-glomerulose, darkly cinereo-fuscescent.

On rocks, rare.

SYN:—*S. carolinum*, Ach. Syn. 285. (1817). Nyl. Scand. 66.

FIG:—E. Bot. Suppl. 2667.

EXS:—M. & N. 947. Anzi It. S. 30. Korb. 271.

GEOG. DISTRIB:—Europe, N. America.

BOT. PROV:—7...11...15...19...30.

ENGLAND:—near Eglestone, Durham. *Rev. J. Harriman*. Wall-town; Housesteads, Northumberland. *Mr. Winch*.

SCOTLAND:—Ben Nevis. *Adm. Jones*. Ben Lomond. *Mr. Cotton*. Ben Cruachan; Ben Nevis; Morrore. *Rev. J. M. Crombie*. Ben Lawers. *Dr. Holl*.

IRELAND:—Dunkerron! *Dr. Taylor*. near Giant's Causeway. *Dr. Moore*.

WALES:—Llyn Aran! near Llyn Gwernon! *Caler Idris*.

Var. *condyloideum*, (Ach.) thallus smaller, podetia slender, simple or branched, branches shortly ramuloso-divided at the apices.

On rocks, rare.

SYN:—Ach. Meth. Suppl. 51. (1803). Nyl. Scand. 66. Crombie En. 17.

GEOG. DISTRIB:—Sweden, Finland.

BOT. PROV:—11. 15.

ENGLAND:—Housesteads, Northumberland. *Mr. Winch*. North West, Durham. *Mr. Thornhill*.

SCOTLAND:—Ben Lawers. *Rev. J. M. Crombie*.

6. *S. nanum*, Ach. very small, flocculoso-pulverulent; podetia slender, caespitoso-congested, simple or branched upwards, branches subfastigate, *obsoletely arachnoid, granules albido-glaucous or subaruginose, minute, nodulose or powdery*; apothecia unknown.

On earth and fissures of rocks, rare.

SYN:—*S. nanum*, Ach. Meth. 315. (1803). Nyl. Scand. 66.

FIG:—Micheli Nov. Gen. t. 53. f. 8.

EXS:—M. & N. 647. Hepp 547. Th. Fr. 37. Mass. 142. Schaer. 588.

GEOG. DISTRIB:—Europe, Algeria, America.

BOT. PROV:—1...5...10...15...30.

ENGLAND:—Lamorna! *Rev. T. Salway*. Worcestershire Beacon, Malvern Hills! *Mr. Lees*. Yorkshire! *Mr. Dixon*. Sweeney, near Oswestry, Shropshire. *Rev. T. Salway*. Teesdale Forest. *Rev. J. Harriman*. Cornwall. *Adm. Jones*. Devonshire. *Rev. J. M. Crombie*. near Exeter. *Mr. Parfitt*.

SCOTLAND:—Den of Balthayock! Perthshire. *Dr. Ogilvie*. West Water! Forfarshire; North banks of the Isla, West of the Reeky

Lin, Forfarshire. *Mr. W. Gardiner*. Stenton Crag, Dunkeld. *Dr. Lindsay*. Grampians, Breadalbane and Braemar. *Rev. J. M. Crombie*. Glen Lochy, near Killin, Perthshire. *Dr. Holl*.

IRELAND :—Learmont, co. Derry. *Adm. Jones*.

### SERIES III. RAMALODEI.

Thallus fruticulose or filamentose, erect or pendulous, terete, or variously compressed or angular, without any leaflets or granular or basal crust, internally tubulose with a hollow medulla, or solid. Apothecia generally lecanorine.

### TRIBE VI. ROCCELLEI.

Thallus ramosa, terete or compressed, whitish, subcartilaginous, internally with a copious filamentose medulla. Apothecia adnate, nigricant. Spores oblongo-fusiform, 3-septate.

### I. ROCCELLA. DC.

Thallus fruticulose, terete or compressed, albicant or cinereo-lurid, opaque, smooth, internally dense. Apothecia lateral, lecideine, lecanorine or irregular, hypothecium thick, black. Spores oblong or fusiform, 3-septate, straight or curved. Spermatia acicular, arcuate.

1. *R. tinctoria*, DC. terete or sub-compressed, whitish, *vermiculari-elongate, simple or bifurcate*; apothecia lecideine, black, albido-pruinose; *spores oblongo-fusiform, 3-septate.* (K red.)

On rocks by seaside.

SYN:—*R. tinctoria*, DC. Fl. Fr. 2. 334. (1805). Nyl. Syn. 258.

FIG:—E. Bot. 211. Nyl. Syn. t. 8. f. 2. Tul. Mem. Lich. t. 16. f. 6. 7.

EXS:—Schær. 602. Mass. 124. Anzi Etr. 4. Hepp. 568.

GEOG. DISTRIB:—Europe, Africa, E. Indies, Central America.

BOT. PROV:—1, 2... 31.

ENGLAND:—Portland Island. *Viscount Lewisham*. Lynmouth Tors. *Miss Atwood*. Devon. *Rev. J. M. Crombie*.

CHANNEL ISLANDS:—Guernsey. *Mr. Gosselin*. St. Ouen's Bay, Jersey. *Mr. W. Stevens*. Scilly Islands. *Sir W. J. Hooker*.

2. *R. phycopsis*, Ach. terete or slightly compressed, whitish, or much branched and densely caespitose; apo-



thecia lecideine, black, naked or pruinose ; spores *fusiformi-oblong*, 3-septate, (K red but soredia—).

On maritime rocks.

SYN:—*R. phycopsis*, Ach. L. U. 440. (1810). Nyl. Syn. 259.

FIG:—Schær. Enum. t. 1. f. 3. Nyl. Syn. t. 8. f. 3. Tul. Mem. L. t. 16. f. 1. 5. 8.

EXS:—Mudd 48. Larb. 11. Mass. 208. Anzi It. S. 25. Hepp 357.

GEOG. DISTRIB:—Europe, Africa.

BOT. PROV:—1, 2.. 31.

ENGLAND:—Bembridge! Isle of Wight; Walls of Godshill Church, Isle of Wight! *Mr. A. G. More*. Coasts of Devon and Cornwall; Portland Island. *Rev. J. M. Crombie*. Scilly Islands. *Sir W. J. Hooker*, Bolt Head, S. Devon. *Dr. Holl*.

CHANNEL ISLANDS:—St. Brelade Bay; Noirmont; Jersey! Jervonsey, Guernsey; Sark. *Mr. Larbalestier*. Scilly Islands. *Rev. J. M. Crombie*. Guernsey. *Rev. T. Salwey*.

3. *R. fuciformis*, Ach. compressed, whitish, albido-glaucous, or glauco-fuscescent, *polished*, *fuciformi-branched*, *rigid*; apothecia marginal, *lecanorine* or *divinoid*, superficial, pruinose; spores fusiform or oblongo-fusiform, 3-septate; (*K—but soredia red.*)

On maritime rocks.

SYN:—*R. fuciformis*, Ach. L. U. 440. (1810). Nyl. Syn. 260.

FIG:—E. Bot. 728. Nyl. Syn. t. 8. f. 5.

EXS:—Boug. 277. Larb. 12. Mandon. 23. Hepp 567. Schær. 553. Mass. 286. Leight. 171.

GEOG. DISTRIB:—Europe, Africa, Central America.

BOT. PROV:—1..31.

ENGLAND:—Tintagel, near Arthurs Castle. *Mr. D. Turner*. Coast of Devon. *Rev. J. M. Crombie*. Bolt Head, S. Devon. *Dr. Holl*.

CHANNEL ISLANDS:—Guernsey. *Mr. Dickson*. Beauport Bay; Noirmont, Jersey! *Mr. Larbalestier*. St. Brelade Bay, Jersey. *Mr. W. Stevens*. Scilly Islands. *Sir W. J. Hooker*.

## TRIBE VII. SIPHULEI.

Thallus podetiiform, whitish, opaque, fistulose. Apothecia unknown.

### I. THAMNOLIA. *Ach.*

Thallus consisting of stipites or podetia which are cylindrical or sub-compressed, cornute, imperforate, simple or branched, apices acute, internally fistulose. Apothecia unknown. Spermatia cylindrical.

1. *T. vermicularis*, (Sw.) chalky-white, 2-4 inches, prostrate, ascending or erect, subulate or turgid, simple or bifurcate, smooth or longitudinally rugulose, dispersed or stipate. (K + )

On mossy earth, rare. 1799.

SYN :—*Lichen vermicularis*, Sw. in Linn. fil. Meth. Muse. 119. (1781).

FIG :—E. Bot. 2029. Hoffm. Pl. Lich. t. 29. f. 1. 2. 3. Nyl. Syn. t. 8. f. 6.

EXS :—Schær. 86. Tuck. 118. Hepp 298. Anzi Cisalp. 28. Fellm. 48.

GEOG. DISTRIB :—Europe, Asia, Central and S. America, New Holland.

BOT. PROV :—7...12. ...15, 16.

ENGLAND :—Skiddaw, Cumberland. *Mr. Pilkington*.

SCOTLAND :—Scotch Mountains. *Mr. Dickson*. (1799). Ben Lawers ! Ben Nevis. *Mr. D. Turner*. Forfarshire. *Mr. W. Gardiner*. Summit of Lochnagar ! Braemar. *Dr. Lindsay*. Peak of Mamsoul, Inverness. *Dr. B. White*.

WALES :—Cader Idris. *Rev. T. Salwey*.

## TRIBE VIII. USNEFI.

Thallus whitish or pallido-virescent, ramose and ramulose, tough, terete, erect or pendulous, internally with a firm filiform axis. Apothecia lecanorine, peltate, thalline margin ramuloso-ciliate. Spores colourless, small, ellipsoid. Paraphyses indistinct.

### I. USNEA, *Hffm.*

Thallus filamentose, erect or pendulous, fibrilloso-ramulose, medullary axis solid. Apothecia concolorous, terminal or lateral. Spores small, ellipsoid, colourless, simple. Sterigmata simple. Spermatia straight, cylindrico-acicular, apically truncate, fusiformi-turgid basally.

1. *U. barbata*, Fr. albido glaucescent or pale cinereo-virescent, terete, variously branched, erect or pendulous ; apothecia concolorous, rather large ; spores shortly ellipsoid.

On trees, pales &c. common. 1778.

E. *U. florida*, Fr. thallus erect, nearly glabrous, more or less polished, divaricato-fibrillose.

SYN :—Fries L. E. 18. (1831). Nyl. Scand. 68.

FIG :—E. Bot. 872. Hoffm. Pl. Lich. t. 30. f. 2.

EXS :—Anzi It. S. 12. Mass. 51. M & N. 260. Wright 5. Schær. 398. Hepp 826. Spruce Am. 49. Mudd 34. Welw. Lus. 115.

GEOG. DISTRIB :—Europe, Asia, Africa, America, Australasia.

BOT. PROV :—1...5, 6...10, 11...14, 15...30, 31.

ENGLAND :—Near Ludlow, Shropshire ! *Rev. T. Salwey*. Ayton Moor ! Cleveland. *Mr. Mudd*. Gibside Woods, Durham. *Mr. Winch*. Wetheley ; Ragley Park, Worcestershire. *Mr. Parton*. Haldon, Devon. *Mr. Parfitt*. New Forest ; near Exeter and Hastings. *Rev. J. M. Crombie*.

SCOTLAND :—Swanston Wood, Edinburgh. *Dr. Greville*. Deerhill Wood, Forfarshire. *Mr. W. Gardiner*. Kinnoul Wood. *Mr. Croall*. Kinnaird. *Mr. J. Laing*. Killin, Braemar. *Rev. J. M. Crombie*.

IRELAND :—Near Belfast. *Mr. Templeton*.

WALES :—Hafod, Cardiganshire. *Sir J. E. Smith*.

CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier*.

f. 2. *hirta*, Fr, thallus erect, or subpendulous, minutely and abundantly fibrillose, much branched, verrucoso-soresediate.

On trees, and pales, common. 1724.

SYN :—Fr. L. E. 18. (1831).

FIG :—E. Bot. 1354. Hoffm. Pl. Lich. t. 30. f. 1.

EXS :—Schær. 399. Mudd 35. Anzi It. S. 16. Hepp 828. Leight. 1. Spruce Am. 50.

GEOG. DISTRIB :—Northern Europe, N. America.

BOT. PROV :—1, 2...5...10, 11...14, 15...20.

ENGLAND :—Stockton Park ; Ingleby ; Greenhow, Yorkshire ! *Mr. Mudd*. near Lewes, Sussex. *Mr. Correr*. Northumberland and Durham. *Mr. Winch*. Haldon, Devon. *Mr. Parfitt*. Midland Counties. *Mr. Purton*. Bedfordshire. *Rev. C. Abbot*. New Forest. *Rev. J. M. Crombie*. Aymestry ! Herefordshire ; Wrekin ! Caradoc ! Haughmond Hill ! Valeswood ! near Ludlow ! and generally in Shropshire.

SCOTLAND :—Berwickshire. *Dr. G. Johnston*. near Aviemore in Strathspey. *Mr. Brodie*. Muchalls and Durris, Kincardineshire ; Killin. *Rev. J. M. Crombie*.

IRELAND :—Glenbower Woods ! near Youghal, co. Cork. *Mr. Carroll*.

f. 3. *dasypoga*, Fr. like *florida*, but thallus elongatopendulous.

SYN :—Fr. L. E. 18. (1831). Nyl. Scand. 69.

FIG :—Dill. Musc. t. 12. f. 6.

EXS :—Anzi It. S. 13. Fellm. 49. Schær. 402. Mass. 84.

GEOG. DISTRIB :—Europe, America, Madagascar, Java, Brazils.

BOT. PROV :—15...19.

SCOTLAND :—Kinnoul Hill, Perth. *Dr. Lindsay*. Countesswells, near Aberdeen ; Killin. *Rev. J. M. Crombie*.

IRELAND :—Muckruss Demesne, Killarney and Castlebernard Park, Bandon. *Mr. Carroll*.

f. 4. *plicata*, Fr. thallus pendulous, entangled, not fibrillose-ramose.

On trees and rocks, frequent. 1696.

SYN :—Fr. L. E. p. 13. (1831).

FIG :—E. Bot. 257. Dill. Musc. t. 11. f. 1. Nyl. Syn. t. 8. f. 9.

EXS :—Schær. 401. M. & N. 116. Mudd 36. Anzi Langob. 414. Hepp 829. Anzi It. S. 14.

GEOG. DISTRIB :—Europe, America.

BOT. PROV :—1, 2, 3, 4...10, 11...13, 14, 15...20...31.

ENGLAND :—Woodcot Wood, Hampshire. *Mr. Doody*. (1696). Dorsetshire. *Dr. Pulteney*. Broughton Bank ! ; Ingleby Park ! ; Cleveland. *Mr. Mudd*. Correythorpe Banks, Castle Howard, Yorkshire. *Mr. Teesdale*. near Bodmin. *Messrs Turner & Sowerby*. Cambridgeshire. *Rev. R. Rolhan*. Northwin, Herts. *Mr. Miller*. Wasckerley Bourn, near Wolsingham, Durham. *Mr. Winch*. Haldon, Devon. *Mr. Parfitt*. Kelvedon, Essex. *Mr. Varenne*.

SCOTLAND :—Barntimpen Linn, par. Kirkpatrick, Dumfriesshire. *Dr. Burgess*. Balmuta ; Pentland Hills ; Drumshoreland Muir. *Dr. Greville*. Berwickshire. *Dr. G. Johnston*. Kinfauns, Perth. *Dr. Lindsay*.

IRELAND :—Glenbower Wood, near Youghal : Ardrum, co. Cork. *Mr. Carroll*.

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey*.

f. 5. *articulata*, Ach. thallus elongato-ramose, with or without fibrillæ, articulato-constricted, more or less inflated.

On trees, rare. 1724.

SYN :—Ach. Meth. 313. (1803). Nyl. Scand. 69.

FIG :—E. Bot. 258. Dill. Musc. t. 11. f. 4.

EXS :—Dicks. 24. Schær. 497.

GEOG. DISTRIB :—Europe, Asia, America, Canaries, Australasia.

BOT. PROV :—1...3...5...7...9...15...23.

ENGLAND :—Exmouth Warren, Devon. *Sir W. J. Hooker*. Liskeard. *Messrs Turner & Sowerby*. near Burnley, Lancashire. *Mr. Willisell*. (1724). near Stockenchurch, Oxford. *Mr. Bobart*. Gattley Park, Herefordshire : near Bishop's Castle, Salop. *Mr. L. Brown*. Forest of Dean, Gloucestershire. *Mr. T. Cole*. Haldon, Devon. *Mr. Parfitt*. near Exeter. *Rev. J. M. Crombie*.

SCOTLAND :—Deerhill, and other Woods, Forfarshire *Mr. W. Gardiner*.

IRELAND :—Malahide. *Mr. Mackay*. Portmarnock, near Dublin. *Dr. Taylor*.

WALES :—Cwin Bychan, near Barmouth ; Bettws-y-Coed. *Rev. T. Salwey*.

f. 6. *ceratina*, Schær. thallus erect or pendulous, papilloso-scabrous, variously fibrilloso-ramose.

On trees, rare.

SYN :—Schær. Spicil. 505. (1840). Nyl. Scand. 69.

FIG :—Schær. Enum. t. 1. f. 1. Nyl. t. 8. f. 8.

EXS :—Schær. 400. M & N. 465. Hepp 567. Spruce Am. 54. Mass. 83.

GEOG. DISTRIB :—Europe, Canaries, E. & W. Indies, Polynesia. N. Granada, Brazils.

BOT. PROV :—2...6...15.

SCOTLAND:—Killin; Breadalbane. *Rev. J. M. Crombie*. Kinnoull Hill, Perth. *Dr. Lindsay*.

WALES :—Hafod, Cardiganshire. *Sir. J. E. Smith*.

f. 7. *rubiginea*, Ach. thallus rubiginose; apothecia concolorous.

On trees, rare. 1869.

SYN :—Ach. L. U. 621. (1810). Crombie in Seem. Journ. Bot. 8. 96.

GEOG. DISTRIB :—N. America.

BOT. PROV :—2.

ENGLAND:—St. Leonards Forest, Sussex; New Forest, Hants. *Rev. J. M. Crombie*. (1869). Hastings. *Dr. Holl*.

## TRIBE IX. RAMALINEI.

Thallus terete or compressed, erect or pendulous, internally with a woolly medulla. Apothecia concolorous or discolorous, lecanorine, thalline margin entire; paraphyses distinct or indistinct. Spores various. Spermatia various.

### I. ALECTORIA, *Ach. pr. p. Nyl.*

Thallus terete or compressed, erect, prostrate or pendulous, filamentose, internally arachnoid or hollow, intricato-ramose, epithallus shining. Apothecia with indistinct paraphyses. Spores ellipsoid. Spermatia slender, acicular, apically fusiformi-incrassate.

1. *A. bicolor*, (Ehrh.) black or fusco-nigricant or castaneo-fuscescent, terete, erect, much branched, divaricato-fibrillose, densely intricate, paler at the apices; apothecia lateral, small, nigricant; spores 8, small, shortly ellipsoid. (K = C =)

On alpine rocks. 1795.

SYN :—Ehrh. Beytr. 3. p. 82, (1788) Nyl. Scand. 71.

FIG :—E. Bot. 1853.

EXS :—M. & N. 167. Schær. 495. Tuck. 2. Mudd 39. Anzi Ven. 17.



GEOG. DISTRIB:—Arctic Europe, Switzerland, France, Arctic America, Himalaya.

BOT. PROV:—1...7...10...15.

ENGLAND:—Stansfield Moor, near Halifax. *Mr. Baker*. Penzance. *Mr. Parfitt*. Kildale Moor; High Cliff!; Cleveland and Farndale!; Yorkshire. *Mr. Mudd*. Dartmoor. *Dr. Holl*. Cornwall. *Dr. Montgomery*.

SCOTLAND:—Ben-y-Gloe. *Mr. Dickson*, (1795). above Loch Tay. *Messrs Turner & Hooker*. Aberfeldy, Perthshire. *Mr. Macmillan*. Top of Lochnagar! Braemar. *Dr. Lindsay*, near Top of Ben Lawers! *Mr. Carroll*. Clova Mountains. *Mr. W. Gardiner*. Breadalbane and Braemar; Canlochan. *Rev. J. M. Crombie*. Killin. *Dr. Holl*.

WALES:—Llyn Bodlyn! and Cwm Bychan, near Barmouth. *Rev. T. Salwey*. North Wales. *Rev. Hugh Davies*. Giant's Pebbles! Cader Idris.

2. *A. nigricans*, (Ach.) castaneo-nigricant, paler at base, terete, or sub-compressed, erect or ascending, opaque, dichotomously branched, intricate, axils more or less lacunoso-impressed; apothecia badio-fuscous, lateral or terminal, adnate; spores 2-3, colourless, large, ellipsoid. (K yellow, C red)

On alpine rocks. rare.

SYN:—Ach. L. U. 615. (1810). Nyl. Scand. 71.

FIG:—Nyl. Syn. t. 8, f. 17, Ach. Meth. t. 6, f. 1.

EXS:—Fellm. 54. Korb. 241. Th. Fr. 28.

GEOG. DISTRIB:—Europe, America.

BOT. PROV:—15.

SCOTLAND:—Ben Nevis; Braemar; Ben-na-boord; Ben Lawers!; Ben-y-gloe! *Rev. J. M. Crombie*. Ben Nevis. *Adm. Jones*.

3. *A. ochroleuca*, (Ehrh.) ochroleucous, fruticulosorect, rigescent, terete or compressed, smooth, lacunoso-impressed, albo-sorediate, branched, ramuli attenuate, apically denigrate; apothecia dark brown, large, receptacle appendiculate; spores 2 or 4, fuscous, large, ellipsoid. (K f + C +)

On the earth in alpine places.

SYN:—Ehrh. Beytr. 3. p. 82. (1788). Nyl. Scan. 72.

FIG:—Hoffm. Pl. Lich. t. 26. f. 2. & t. 68. f. 5. 7. Nyl. Syn. t. 8. f. 21.

EXS:—M. & N. 853. Schær. 395. Fellm. 52. Zw. 384. Hepp 832. Anzi It. S. 23. Mass. 48.

GEOG. DISTRIB:—Alps & Arctic Europe & N. America, Himalaya, Mexico, Japan, New Holland.

BOT. PROV:—7...11...15.

ENGLAND:—Eglestone Moors, Durham. *Rev. J. Harriman*.

SCOTLAND:—Highlands of Scotland. *Mr. Macmillan*. Cairntoul, Braemar. *Rev. J. M. Crombie*.

WALES:—Cwm Bychan! near Barmouth. *Rev. T. Salwey*.

Var. *cincinnata*, Fr. prostrate, compressed, thicker, dilated below, lacunose or foveolate, with long slender attenuate entangled branches above. (K f + C +) medulla K—C reddish.

In alpine places, rare.

SYN:—Fr. L. E. 22. (1830). Nyl. Scand. 73.

FIG:—E. Bot. 2040.

EXS:—Fellm. 53.

GEOG. DISTRIB:—Europe, America.

BOT. PROV:—15, 16.

SCOTLAND:—Morrone; Ben-na-boord; Ben Lawers! *Rev. J. M. Crombie*. Ben-Mac-Dhiu. *Mr. Macmillan*. Ben Luighal, Sutherland, and Cairngorm, Invernessshire. *Messrs Hooker & Borrer*. Summits of Morne and Morchone, Braemar. *Dr. W. L. Lindsay*.

Var. *crinalis*, Ach. pallido-cinerascent, very slender, much implexo-ramose, filiform. (K f + C +)

On moss, very rare.

SYN:—Ach. L. U. 495. (180.) Syn. 292. Nyl. Syn. 283.

EXS:—Fellm. 51.

GEOG. DISTRIB:—Scandinavia.

SCOTLAND:—Morrone. *Rev. J. M. Crombie*.

*Alectoria sarmentosa*, Ach. is a distinct species with chemical reaction (K = C +) and is represented in Th. Fr. 27. M. & N. 755. 464. and in Hoffm. Pl. Lich. t. 72. I am not aware of its having been found in Great Britain.

4. *A. cana*, Ach. pallido-canescens or pale flavido-rufescent, pendulous, elongate, dichotomously branched, flaccid, densely entangled, sub-compressed, angular and sublacunose below, filiform and capillary above; apothecia unknown. (K + C +)

On trees &c.

SYN:—Ach. L. U. 593. (1810).

FIG:—Westr. Sv. Lafv. Farg.-Hist. V. 1. n. 14. fig. B.

EXS:—Schær. 496. Anzi It. S. 18, 19, 20, Th. Fr. 52. Hepp 831.

GEOG. DISTRIB:—Europe.

BOT. PROV:—10.

ENGLAND:—Yorkshire! *Mr. Dixon*.

SCOTLAND:—Killin, Braemar. *Rev. J. M. Crombie*.

The different chemical reaction appears to separate this as a distinct species from all forms of *A. jubata*.

5. *A. jubata*, Ach. fuscous or nigricant, livido-fus-

cescent or pallescent, terete, filiform, elongate, slender, ramose, pendulous or prostrate, entangled; apothecia brown, plane or convex, small; spores 8, colourless, small, elliptical. (K *f* + C —)

On trees and rocks in mountainous places.

SYN:—Ach. L. U. 592. (1810). Nyl. Scand. 72.

FIG:—E. Bot. 1889. Nyl. Syn. t. 8. f. 18. & 19. Dill. t. 12. f. 7.

EXS:—Schær. 396. 397. 496. Mudd 37. Leight. 72.

GEOG. DISTRIB:—Europe, N. America, W. Indies, N. Africa, Canaries, Himalaya, Java.

BOT. PROV:—1, 2...5...7, 8...10, 11...14, 15...18...22, 23.

ENGLAND:—Baysdale! Ayton Moor! Kildale Moor; Cleveland. *Mr. Mudd*. Dartmouth. *Mr. R. Brown*. Longformacus, Northumberland. *Mr. T. Brown*. Rawse Castle; Longridge Dean; Murton Craigs; Darrington Law, Northumberland. *Dr. G. Johnston*. Ludlow and Oswestry!, Shropshire. *Rev. T. Salway*. Malvern Hills, Worcestershire; Ragley near Kingley, Warwickshire. *Mr. Purton*. Gateshead Fell, Durham. *Mr. Thornhill*. Dartmoor; near St. Leonard's, Sussex. *Dr. Holl*. Charnwood Forest; Gopsall. *Rev. A. Bloom*. Lustleigh Cleve, Devon. *Mr. Parfitt*. Pearts Crags, near Settle. *Dr. Windsor*. Bedfordshire. *Rev. C. Abbot*.

SCOTLAND:—Deerhill Woods, Forfarshire! *Dr. G. Lawson*. Invercauld, Braemar!; Craig-y-Barus, Dunkeld!; Knack Hill, Crieff! *Dr. Lindsay*. Pentland Hills; Swanston Wood. *Dr. Greville*. Killin; Rothiemurchus. *Rev. J. M. Crombie*. Garrrynahine, Lewis. *Dr. Lindsay*.

IRELAND:—Knockcurris, Innishowen. *Mr. R. Brown*. Lough Bray; Killiney Hills. *Dr. Taylor*. Luggelaw, co. Wicklow. *Adm. Jones*.

WALES:—Diffwys; Llyn Bodlyn! near Barmouth. *Rev. T. Salway*. Cader Idris. *Dr. Holl*.

Var. *chalybeiformis*, Ach. olivaceo-black, flexuose, decumbent, subfilamentose, wiry and rigid, shortly branched, intricate. (K *f* + C —)

On alpine rocks and boulders.

SYN:—Linn. Syst. Nat. (1767). Nyl. Scand. 72.

FIG:—Dill. t. 13. f. 10.

EXS:—Mudd 38. Schær. 396. Anzi It. S. 21.

GEOG. DISTRIB:—Europe.

BOT. PROV:—10, 11...15.

ENGLAND:—Battersby Bank! Cleveland. *Mr. Mudd*. Charnberry, near Eglestone, Durham. *Mr. Winch*.

SCOTLAND:—Loch-na-gar!; Braemar; Birnam Hill, Dunkeld. *Dr. Lindsay*. Highlands. *Messrs Turner & Hooker*. Clova Mountains. *Mr. W. Gardiner*.

## II. EVERNIA. Ach. Nyl.

Thallus flaccid, erect or ascending or prostrate or

pendulous, appanate or subterete, laciniose, or very much branched, destitute of rhizinae beneath, internally stuppeous. Apothecia lateral. Spores small, ellipsoid, simple. Paraphyses indistinct. Sterigmata paucarticulate. Spermatia slender, acicular, fusiformi-incrasate and acute at both apices.

1. *E. furfuracea*, Mann. cinerascens, dichotomously multi-laciniate, upper surface isidioso-furfuraceous or fibrillose, under surface canaliculate black or caesi-nigricant; apothecia sub-marginal, badio-rufous, receptacle smooth; spores ellipsoid. (K + C +)

On trees, pales, &c. common.

SYN:—Mann. Lich. Boh. p. 105. (1826). Nyl. Scand. 73.

FIG:—E. Bot. 984. Hoffm. Pl. Lich. t. 9. f. 2.

EXS:—Tuck. 55. M. & N. 63. Schær. 387. Anzi It. S. 71. Hepp 834. Mudd 40. Leight. 37.

GEOG. DISTRIB:—Europe, N. Africa, Canaries, Asia, N. & Central America.

BOT. PROV:—1...5...7...10, 11...15...23.

ENGLAND:—Eglestone, Durham. *Rev. J. Harriman*. Farndale!; Ayton Moor! Yorkshire. *Mr. Mudd*. Oswestry!; Mynydd-y-Myfyr, Shropshire. *Rev. T. Salwey*. Chillingham Park; Rawse Castle, Northumberland. *Dr. G. Johnstone*. Dartmoor. *Mr. Parfitt*. Wrek-in! Caer Caradoc! Hay Park! near Ludlow, and other places! in Shropshire.

SCOTLAND:—Balthayock Woods, Perth!; Johnston Hill!; Forfar. *Dr. Lindsay*. Deerhill and Baldovan Woods, Forfarshire. *Mr. W. Gardiner*. Killin; Braemar. *Rev. J. M. Crombie*. (forma *scobicina* Ach. isidioso-furfuraceous or isidioso-hispid) Ben Lawers; Crainlorich. *Dr. Holl*.

IRELAND:—Lough Bray, near Dublin. *Dr. Taylor*. Rochestown Hill, co. Dublin. *Herb. Trin. Coll. Dubl*.

WALES:—Cwm Bychan, near Barmouth. *Rev. T. Salwey*.

2. *E. prunastri*, (L.) whitish, or albido-pallescent or albido-flavescent, multi-laciniate, lacunosorugose, margins generally albo-sorediate, subcanaliculate and pale beneath; apothecia lateral or marginal, badio-rufous, receptacle rugose; spores ellipsoid. (K + C +)

On trees, common.

SYN:—Linn. Sp. Pl. 1614. (1753). Nyl. Scand. 74.

FIG:—E. Bot. 859.

EXS:—M. & N. 355. Tuck. 54. Schær. 391. Anzi It. S. 70. Hepp 833. Mudd 41. Leight. 36. Larbal. 59.

GEOG. DISTRIB:—Europe, N. Africa, Asia, N. America, Peru.

BOT. PROV:—1...3...5...7...10, 11, 12...15...19, 20...30, 31.

ENGLAND:—Thirsk ! Yorkshire. *Mr. Baker*. Oswestry ! Shropshire. *Rev. T. Salwey*. Keswick, ! Cumberland. *Mrs. Stanger*. Lonsdale ! and Kildale ! Cleveland. *Mr. Mudd*. Berwick-on-Tweed. *Dr. G. Johnston*. Gibside Woods, Durham. *Mr. Winch*. Wallington, Northumberland. *Miss Trevelyan*. Essex. *Mr. Varenne*. Holbrig Hall, near Settle. *Dr. Windsor*. Midland Counties. *Mr. Purton*. Nesscliffe ! Bomere Pool ! Haughtmond Hill ! Shrewsbury ! Shropshire.

SCOTLAND:—Kinnoul Hill ! Perth ; Arniston Woods ! Edinburgh ; Blaeberry Hill ! Perth. *Dr. Lindsay*. Deerhill and other woods on the Siddlaws. *Mr. W. Gardiner*. Falls of Moness, Aberfeldy. *Dr. Holl*. Killin ; Braemar ; Durris ; Countesswells. *Rev. J. M. Crombie*.

IRELAND:—Castlebernard Park ! Bandon ; Blarney ! Castlemartyr ! near Cork. *Mr. Carroll*. near Belfast. *Mr. Templeton*. near Bantry. *Miss Hutchins*. near Killarney. *Mr. Gough*.

WALES:—Cessel Cwm and Cwm Bychan, near Barmouth. *Rev. T. Salwey*.

CHANNEL ISLANDS:—Jersey ; Guernsey. *Mr. Larbalestier*.

Var. *stictocera*, (Sm.) thallus with small fuscous or fuscous-black tubercles. E. Bot. 1353. (K + C + )

On the sandy banks in the warren opposite Exmouth, Devonshire. *Mr. Brodie*. Quenvais, Jersey ! *Mr. Larbalestier*.

### III. RAMALINA, *Ach. Fr.*

Thallus whitish or pale, compressed, somewhat shining, rigescent, erect or prostrate, laciniate, alike on both sides. Apothecia scattered or marginal, concolorous, Spores colourless, oblong, curved, 1-septate. Paraphyses distinct. Sterigmata elongato-pauci-articulate with anastomosing filaments. Spermatia cylindrical, or oblongo-cylindrical, straight.

1. *R. scopulorum*, *Ach.* pale, *shining*, variable in size, breadth and branching, cartilaginous, *elongate, compressed, more or less longitudinally striato-nervose, lacunose and sorediato-tuberculate* ; apothecia lateral or subterminal, pale, subpodicellate, margin obsoletely crenulate ; spores oblong, straight.

On maritime rocks, not uncommon. (1793.)

SYN:—*Ach. L. U.* 604. (1810). *Nyl. Scand.* 75.

FIG:—*E. Bot.* 688. *Nyl. Syn. t.* 8. f. 29.

EXS:—*Schær.* 554. *Leight.* 2. *Bourg.* 351. *Hepp* 837. *Anzi It.* 5. 69. *Th. Fries.* 1. *Welw.* 38. 36. *Larb.* 13.

GEOG. DISTRIB:—Europe, Africa, Asia, Australasia.



BOT. PROV :—1...7...10, 11...14, 15, 16, 18...23...30, 31.

ENGLAND :—Lamorna Cove, Cornwall. *Mr. Knapp*. Land's End. *Messrs Turner & Sowerby*. Marshall Meadows and Hudshead, Northumberland. *Dr. G. Johnston*. Yorkshire. *Mr. Dixon*. near Settle. *Dr. Windsor*. Newbiggen; Dunstanborough; Bamborough; the Heugh; St. Cuthberts Island; Holy Island; Staples and Fern Islands, Northumberland. *Mr. Winch*. Hartley Bates, Northumberland. *Mr. Thornhill*. near Torquay; Bolt Head, S. Devon; near Hay Tor, Dartmoor. *Dr. Holl*. Lustleigh Cleve; Blackstone Rock, Dartmoor. *Mr. Parfitt*.

SCOTLAND :—Standing Stones of Stenhouse, Orkney. *Sir W. J. Hooker*. Caroline Park; coast of Fife about Pettycur and Kirkaldy; King's Park, near Edinburgh; Isle of Bute. *Dr. Groville*. Banks of the Tay! Lundie Craigs; Turin Hill, Forfarshire. *Mr. W. Gardiner*. Clova. *Mr. Croall*. Arran. *Prof. Balfour*. Kincardine. *Rev. J. M. Crombie*. Callernish; Garrynahine, Lewis; Stennis, Orkney. *Dr. Lindsay*.

IRELAND :—Near Howth. *Dr. Taylor*. Ardglass, co. Down. *Dr. Maingay*.

WALES :—South Stacks, Holyhead!

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey*. St. Brelade's Bay, Jersey. *Mr. Stevens*. Grosnez Common, Jersey, and all the Islands. *Mr. Larbalestier*.

2. *R. polymorpha*, Ach. pale, scarcely shining, small, robust, densely caespitose, dilatato-compressed, coarsely longitudinally striato-rugose, sorediate; apothecia subterminal; spores oblongo-ellipsoid or oblong, straight or curved.

On maritime rocks, not uncommon.

SYN :—Ach. L. U. 600. (1810). Nyl. Scand. 76.

FIG :—Ach. in V. Ac. H. 1790. t. 11. f. 3.

EXS :—M. & N. 636. Schaer. 394. Mudd 47. Hepp 563. Anzi Langob. 420, Leight. 73.

GEOG. DISTRIB :—Europe, Africa, N. America, New Holland.

BOT. PROV :—10, 11.. 15.. 30, 31.

ENGLAND :—Eglestone, Durham. *Rev. J. Harriman*. Whitsuncliffe, near Thirsk, Yorkshire. *Mr. Baker*. High Cliff and top of Roseberry and Howden Gill, Cleveland. *Mr. Mudd*.

SCOTLAND :—Kincardine. *Rev. J. M. Crombie*.

IRELAND :—Near Belfast. *Mr. Templeton*.

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey*.

3. *R. calicaris*, Fr. pale, glaucous grey, albescens or albido-flavescent, rigescent, compressed, linear, longitudinally lacunose, variously and narrowly divided, often canaliculate; apothecia subterminal, pale or pale-flesh-coloured; spores curved or straight.

F. 1. *canaliculata*, Fr. erect, dichotomously branched,

laciniae linear, elongated, attenuated at the apices, longitudinally lacunoso-canaliculate; apothecia terminal, subtended by the deflexed and elongated extremities of the laciniae.

On trees.

SYN :—Fries. L. E. 30. (1831). Nyl. Syn. 293.

FIG :—Dill. t. 23. f. 62. A. B. Moris. 3. § 15. t. 7. f. 5.

EXS :—Schær. 493. Mudd 44. Welw. Lusit. 42. Mass. 115. Anzi Ital. S. 63. M. & N. 452. Mand. 24.

GEOG. DISTRIB :—Europe, Africa, America, Asia, Polynesia.

BOT. PROV :—1...3 ..5...10...13 ..15.. 20.. 31.

ENGLAND :—Airyholme Woods ! Ayton, Yorkshire. *Mr. Mudd*. Oswestry ! Shropshire. *Rev. T. Salwey*. Exmouth Warren, Devon. *Mr. Parfitt*. Kelvedon, Essex. *Mr. Varenne*. Shropshire !!!

SCOTLAND :—Ayrshire ! *Mrs. Stanger*. Johnstone's Hill, Forfar. *Dr. Gilchrist*.

IRELAND :—Near Coacbford and Fermoy ! co. Cork. *Mr. Carroll*.

CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier*.

F. 2. *farinacea*, (L.) erect, dichotomously branched, laciniae linear, elongated, undulato-attenuated at the apices, compressed, flat and polished, sometimes sublacunose, canaliculate, with white oblong more or less confluent soredia on the edges.

On trees. 1795.

SYN :—Linn. Fl. Succ. 1019. (1795). Nyl. Syn. 294.

FIG :—E. Bot. 889.

EXS :—M. & N. 356, Anzi It. S. 67. Etr. 6. Schær. 494. Mudd 45. Leight. 40,

GEOG. DISTRIB :—Generally throughout the world.

BOT. PROV :—1...3, 4, 5...10. 11...13, 14, 15...19...30, 31.

ENGLAND :—Berwick-on-Tweed. *Dr. G. Johnston*. Kildale ! Newton ! Cleveland. *Mr. Mudd*. Thirsk ! Yorkshire. *Mr. Baker*. Oswestry ! Shropshire. *Rev. T. Salwey*. Oxfordshire. *Dr. Sibthorp*. Bedfordshire. *Rev. C. Abbot*. Cambridgeshire. *Rev. R. Rolhan*. Durham. *Mr. Winch*. Woods, Devon. *Mr. Parfitt*. Kelvedon, Essex. *Mr. Varenne*. Stackhouse Borrins, near Settle. *Dr. Windsor*. Midland Counties. *Mr. Purton*. Pulley ! Shomere Woods, ! Shropshire.

SCOTLAND :—Edinburgh ; Granton ; Swanston ; Corstorphine ; Rosslyn ; and Auchindenny Woods. *Dr. Greville*. Deerhill Wood, Forfarshire. *Mr. W. Gardiner*. Balthayock Woods ! Perth ; Yester House ! Haddington. *Dr. Lindsay*. Ayrshire ; ! *Mrs. Stanger*.

IRELAND :—Near Belfast. *Mr. Templeton*. Dunkerron. *Dr. Taylor*. Fermoy ! near Cork. *Mr. Carroll*. Luggelaw. *Adm. Jones*.

CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier*.

*F. 3. thrausta*, (Ach.) thallus *angustissimo-divided*, laciniae *terete* or *sub-compressed*, *smooth*.

On alpine and sub-alpine rocks, rare.

SYN:—Ach. L. U. 596. (1813). Nyl. Syn. 296. Crombie En. 25.

EXS:—Fr. L. S. 267.

GEOG. DISTRIB:—Europe, Africa.

BOT. PROV:—1...5.. 15...31.

ENGLAND:—Babicombe, Devon. *Mr. Parfitt*. Longmynd ! Salop.

SCOTLAND:—Coast of Kincardineshire ; Morrone ; Braemar ; Craig Tulloch. *Rev. J. M. Crombie*.

CHANNEL ISLANDS:—The Warrens, Noirmont, Jersey. *Mr. Larbalestier*.

*F. 4. fraxinea*, Fr. *pendulous*, *straggling*, laciniae compressed, *broadly applanato-dilated*, lacunose, *elongated and attenuated at the apices* ; apothecia large, marginal and superficial.

On trees, very common. 1798.

SYN:—Fries. L. E. 30. (1831). Nyl. Syn. 294.

FIG:—E. Bot. 1781.

EXS:—M. & N. 158. Schær. 492. Anzi It. S. 60. 62. 59. Mass. 117. 116. 119. 118. Spruce. 55. Leight. 38.

GEOG. DISTRIB:—Europe, Africa, America, Asia, Australasia.

BOT. PROV:—1...3, 4, 5...7 ..8...8, 11...14, 15...19...23...31.

ENGLAND:—Charnwood Forest ! Leicestershire. *Rev. A. Bloxam*. Berwick-on-Tweed. *Dr. G. Johnston*. Oswestry ! Shropshire. *Rev. T. Salwey*. Ayton ! Cleveland. *Mr. Mudd*. Thirsk ! Yorkshire. *Mr. Baker*. Bedfordshire. *Rev. C. Abbot*. Oxfordshire. *Dr. Sibthorp*. Cambridgeshire. *Rev. R. Relhan*. Durham. *Mr. Winch*. Exminster Marshes, Devon. *Mr. Parfitt*. Kelvedon, Essex. *Mr. Varcenne*. Midland Counties. *Mr. Purton*. Pulley ! Haughmond Hill ! and generally in Shropshire !!

SCOTLAND:—Edinburgh. *Dr. Greville*. Forfarshire. *Mr. W. Gardiner*. Invercauld ! Braemar. *Dr. Lindsay*.

IRELAND:—Hill of Howth. *Mr. Templeton*. Kerry. *Dr. Taylor*.

WALES:—Llandrindod ! Radnorshire. *Rev. T. Salwey*.

CHANNEL ISLANDS:—Guernsey. *Rev. T. Salwey*. common on all the Islands. *Mr. Larbalestier*.

*F. 5. fastigiata*, Fr. *small*, *densely cæspitose*, compressed, sterile laciniae digitato-divided at the apex, *fertile ones dilated and inflated upwards* ; apothecia terminal, *sub-fastigiate*, subtended by the very short deformed divaricate extremities of the laciniae.

On trees, common. 1741.

SYN:—Fries. L. E. 30. (1131). Nyl. Syn. 294.

FIG:—E. Bot. 890. lower left hand fig : Dill. t. 23. f. 62.

EXS:—Tuck. 58. M. & N. 452. Schaer. 491. Welw. 41. Anzi It. S. 65. 61. 64. Etr. 5. Mass. 176. 287. Mudd 43. Leight. 39. Larbal. 60.

GEOG. DISTRIB:—Europe, Africa, Asia, America, Australasia.

BOT. PROV:—1, 2, 3, 4, 5...8...10, 11...14, 15...19, 20...31.

ENGLAND:—Charnwood Forest! Leicestershire. *Rev. A. Bloxam*. Oswestry! Shropshire. *Rev. T. Salwey*. Ayton! Cleveland. *Mr. Mudd*. Berwick-on-Tweed. *Dr. G. Johnston*. Gloucester. *Mr. T. Cole*. Slinfold, Sussex; Stiperstones, Shropshire. *Dillenius*. (1741). Bedfordshire. *Rev. C. Abbot*. Cambridgeshire. *Rev. R. Relhan*. Durham. *Mr. Winch*. Stoke Wood, Exeter. *Mr. Parfitt*. Kelvedon, Essex. *Mr. Varenne*. Midland Counties. *Mr. Purton*. Pulley! Haughmond Hill! Shropshire.

SCOTLAND:—Swanston Wood; Colinton and Granton Woods; Corstorphine Hill; Braid Hermitage, near Edinburgh. *Dr. Greville*. Forfarshire. *Mr. W. Gardiner*. Rumbling Bridge. *Prof. Balfour*. Kinnoul Hill! Perth; Yester House! Haddington. *Dr. Lindsay*.

IRELAND:—Derriquin, co. Kerry. *Dr. Taylor*. Great Island! Cork. *Mr. Carroll*.

CHANNEL ISLANDS:—Guernsey. *Rev. T. Salwey*. Jersey; Serk! and all the Islands. *Mr. Larbalestier*.

4. *R. pollinaria*, Ach. *densely caespitose*, pale or whitish or albido-glaucous, *membranaceo-laciniose*, *laciniae short, greatly dilated*, sublacinose or lacunosocorrugate, *flaccid, covered with broad white sorediate confluent patches*.

On trees, palings, &c., not very common.

SYN:—Ach. L. U. 608. (1810). Nyl. Syn. 296.

FIG:—Ach. in V. Ac. H. 1796. t. 11. f. 2.

EXS:—M. & N. 546. Schaer. 393. Anzi It. S. 68. Rabh. 766. Mudd 46, Hepp 564. 565. 566. Leight. 41.

GEOG. DISTRIB:—Europe, Asia, Africa, W. Indies.

BOT. PROV:—3, 4, 5...8...10, 11...19...30, 31.

ENGLAND:—Norfolk and Suffolk. *Sir W. J. Hooker*. Dorrington; Lodge, near Ludlow, Shropshire. *Rev. T. Salwey*. Ingleby!; Cleveland. *Mr. Mudd*. Teesdale. *Rev. J. Harriman*. Twycross! Leicestershire. *Rev. A. Bloxam*. Totham, Essex. *Mr. Varenne*. near Lewes; Tunbridge Wells; Maidstone. *Rev. J. Crombie*. Caer Caradoc! Haughmond Hill! Shropshire.

IRELAND:—near Belfast. *Mr. Templeton*. Killarney. *Dr. Carrington*.

CHANNEL ISLANDS:—Guernsey. *Rev. T. Salwey*. Jersey. *Mr. Larbalestier*.

## TRIBE X. CETRARIEI.

Thallus compressed, rarely terete, variously fruticulose, or narrower, or frondose, membranaceous, dilatate or lobate, epithallus somewhat shining, internally filled



with a white woolly medulla. Apothecia lecanorine, marginal. Spores 8, small, colourless, simple. Paraphyses indistinct. Spermogonia marginal, in setuliform apiculi, or black papillæ.

### I. CETRARIA. *Ach. pr. p. Nyl.*

Thallus spadiceous or spadiceo-pallescent, rigescent, erect or ascending, laciniose, rarely fistulose, somewhat shining. Apothecia dull or bright brown. Spermata cylindrical.

1. *C. islandica*, (L.) pale or pale chesnut-brown or fuscous, *laciniae* broad, variously divided, frequently subcanaliculate, margins spinuloso-ciliated, with impressed white soredia on the back; apothecia brown, large, adnate to the upper surface of the apices of the *laciniae*, receptacle entire or crenulate.

On the ground in sub-alpine places, rare. 1794.

F. 1. *platyna*, Ach. *laciniae* platyphyllous, margins spinuloso-ciliated.

SYN:—Ach. Syn. 229. (1817). Nyl. Scand. 79.

FIG:—E. Bot. 133. Nyl. Syn. t. 8. f. 32.

EXS:—Schær. 22. Mudd 51. Leight. 42. Anzi It. S. 48. Mass. 102. Fellm. 58. Hepp 169.

GEOG. DISTRIB:—Frigid & Alpine Europe, N. America, Himalaya.

BOT. PROV —7...10, 11...13, 14, 15...18, 19, 20.

ENGLAND:—Durham. Rev. J. Harriman. Murton Craigs; Belford; Lamberton Moor, Berwick-on-Tweed. Dr. G. Johnston. Flarendale and on Seamer Moor, near Scarborough, Yorkshire. Mr. Baker. Ter-  
rington; Stockton; Earsley Moors, Yorkshire. Mr. Teesdale. (1794). Ingleborough; Gregareth, Yorkshire. Dr. Windsor. Gateshead, Whickham and Muggleswick Fells; Teesdale and Weardale, Durham. Cheviot; Hedgehope; Simonside; Wallington Moors, Northumberland. Mr. Winch.

SCOTLAND:—Pentland Hills, near Edinburgh; Ben Lomond. Sir. J. E. Smith. Ben-na-boord, Aberdeenshire; King's Park; Corstorphine; Dalmahoy. Dr. Greville. Moine near Castleton, Braemar. Prof. Graham. Sidlaw Hills; Clova Mountains! Forfarshire. Mr. W. Gardiner. Long Island. Prof. Balfour. Hart-fell, Moffat. Dr. Nichol. Morchone, Braemar. Mr. Croall. Ben Maedhui!, Braemar. Mr. Baker. Loch-na-Garr! Rev. T. B. Bell. Muirhall, Perth. Dr. Lindsay. Grampians. Rev. J. M. Crombie.

IRELAND:—Summit of Mangerton. Dr. Taylor. Devl's Ladder, Carrantuel, Mc Gillicuddy's Reeks. Mr. Hardy.

WALES:—Cader Idris. Rev. T. Salwey.



F. 2. *crispa*, Ach. laciniae *stenophyllous*, intricate, erect or depressed, canaliculate or with margins *connivent or interruptedly tubulose*, margins spinuloso-ciliated.

SYN :—Ach. L. U. 513. (1810).

FIG :—Dill. t. 28. f. 112.

EXS :—Schær. 23. Mudd 52. Tuck. 3. Anzi Langob. 21. It. S. 49. Fellm. 59. Hepp 170.

GEOG. DISTRIB :—Northern Europe and Cape Horn.

BOT. PROV :—11...15.

ENGLAND :—Widdy Bank, Teesdale, Durham. *Mr. Mudd.*

SCOTLAND :—Ben Lawers ! Ben Mc Dhui ; *Dr. Lindsay.* Top of Ben Nevis ! *Rev. T. B. Bell.*

2. *C. Delisei*, (Schær.) pale or chesnut-brown, densely caespitose, laciniae narrow, elongate, canaliculate, palmato-multifid, recurved, apices spinulose ( $K = C +$  slightly red) ; apothecia brown, large, subterminal.

On alpine rocks, very rare. 1869.

SYN :—Schær. Enum. 16. (1850.) Nyl. Scand. 79.

EXS :—Fellm. 60. Th. M. Fries. 54.

GEOG. DISTRIB :—Scandinavia.

BOT. PROV :—15.

SCOTLAND :—Summit of Lochnagar in Braemar. *Rev. J. M. Crombie.*

3. *C. aculeata*, Fr. spadiceous, fistulose, *terete or compressed* or angular, rigid, erect, ramose, *caespitoso-fruticulose*, branches *divaricate*, more or less nigro-spinulose ; apothecia spadiceous, small, *terminal*.

On moors, heaths, rocks, &c., not uncommon.

F. 1. *typica*, spadiceous, *plano-compressed, sublacunose, naked*, divaricato-spinulose at the apices.

SYN :—Ach. Meth. 302. (1803.) Nyl. Syn. 300.

FIG :—Ach. Meth. t. 6. f. 2.

EXS :—Mudd 50. Leight. 3.

GEOG. DISTRIB :—North and Central Europe, Arctic America, Antarctic America.

BOT. PROV :—3...5...7, 8, 10, 11...14, 15...19.. 30, 31.

ENGLAND :—Dirrington Law, Northumberland. *Dr. G. Johnston.* Craigforda, near Oswestry, Shropshire. *Rev. T. Salway.* High Green Wood, Todmorden. *Mr. Baines.* Shipley Common, Yorkshire. *Mr. Hailstone.* Lyndhurst Moor. *Rev. J. M. Crombie.* Flazendale. *Mr. Baker.* Malham. *Dr. Carrington.* Ayton Moor ; Farndale ! Burton Head ; and other places in Yorkshire. *Mr. Mudd.* Simonside ; Prestwick Carr, Northumberland ; Gateshead and Ravensworth Fells, Durham. *Mr. Winch.* Malvern Hills, Worcestershire. *Mr. Purton.* Charnwood Forest, Leicestershire. *Rev. A. Bloram.* Tip-tree Heath, Essex. *Mr. Verrane.* Sugar Loaf, Monmouthshire. *Mr.*

*Purton*. Peart's Crags, near Settle. *Dr. Windsor*. Spout Valley, Long-Mynd! Pontesford Hill! Haughmond Hill! Stiperstones! Shropshire.

SCOTLAND :—Pentland Hills. *Dr. Greville*. Forfarshire. *Mr. W. Gardiner*. Glen Nevis! Invernessshire; Blaeberry Hill, ! Perth. *Dr. Lindsay*. Aberdeen Links; Grampians. *Rev. J. M. Crombie*.

IRELAND :—Near Belfast. *Mr. Templeton*. Southern Counties. *Dr. Taylor*.

WALES :—Cwm Bychan, near Barmouth. *Rev. T. Salwey*. Arran Mowddy. !

CHANNEL ISLANDS :—Quenvais, Jersey, *Mr. Larbalestier*.

F. 2. *muricata*, Ach. *smaller, densely intricato-cæspitose, densely ramulose, subterete, or sub-compressed, naked, shortly divaricato-spinulose at the apices.*

SYN :—Ach. Meth. 302. (1803). Nyl. Scand. 80.

FIG :—E. Bot. 452.

EXS :—M. & N. 756. Schaer. 555. Welw. 8, Mudd 49. Leight. 4.

GEOG. DISTRIB :—Alpine Europe.

BOT. PROV :—5...7...10...14, 15.

ENGLAND :—Beverley. *Mr. Teesdale*. Ayton! Yorkshire. *Mr. Mudd*. Craigforda! near Oswestry. *Rev. T. Salwey*. Malvern Hills; Stiperstones, Salop; Sugar Loaf, Monmouthshire. *Mr. Purton*. Long Mynd! Haughmond Hill! Stiperstones! Laurence Hill! Shropshire.

SCOTLAND :—Pentland Hills. *Dr. Greville*. Forfarshire. *Mr. W. Gardiner*. Ben Nevis! *Dr. Lindsay*. Glen Muick and Glen Dee, Braemar. *Rev J. M. Crombie*.

WALES :—Barmouth!

F. 3. *acanthella*, Ach. like *typica*, but entirely *hispidospinuloso-denticulate*.

SYN :—Ach. L. U. 612. (1810).

FIG :—Hoffm. Pl. Lich. t. 5. f. 2.

EXS :—Schaer. 254. pr. p. M. & N. 168. Zw. 222. Welw. 10. Anzi Langob. 416. b.

GEOG. DISTRIB :—Switzerland, Germany, Portugal, Italy.

BOT. PROV :—10...15.

ENGLAND :—Hambleton! Yorkshire. *Mr. Baker*. Ayton! Cleveland. *Mr. Mudd*.

SCOTLAND :—Hill of Ardo, near Aberdeen. *Rev. J. M. Crombie*.

## II. PLATYSMA. *Hffm. pr. p. Nyl.*

Thallus various in colour, nigrescent, fruticulose, generally membranaceo-dilated, lobate or laciniate, nearly subterete. Apothecia marginal or sub-marginal. Spermatogonia minutely papillate or tuberculate. Spermatia incrassate at both the obtuse apices, or fusiformi-incrassate at one apex, or fusiformi-ellipsoid.

*A. Spermatia incrassate at both the obtuse apices.*

1. *P. nivale*, (L.) ochroleucous or stramineous, *sinuato-laciniate*, laciniae *canaliculato-patulous*, *reticulato-lacunose*, dentate at the *erect* apices (K—C+); apothecia flesh-coloured, margin of receptacle crenato-rugose; spores 8, colourless, oblong, small, simple.

On the ground in alpine places.

SYN:—Linn. Fl. Suec. 1086. Nyl. Syn. 302.

FIG:—E. Bot. 1994. Nyl. Syn. t. 8. f. 33.

EXS:—Schær 19. Tuck. 59. Anzi It. S. 51. Hepp 845. Mudd 53. Leight. 43.

GEOG. DISTRIB:—Europe, N. America.

BOT. PROV:—15.

SCOTLAND:—Highlands. *Dr. Rob. Townson*. Cairngorm and Ben Lawers. *Sir W. J. Hooker*. Bassies; Ben Red; Loch Brandy; Clova! *Mr. W. Gardiner*. Source of the Dee; Lochnagar; Morchone; Braemar! *Dr. W. L. Lindsay*. Ben-na-Bourd! Clova. *Rev. T. B. Bell*. Ben Mc Dhui. *Mr. J. G. Baker*.

2. *P. cucullatum*, (Bell.) ochroleucous or stramineous, *canaliculato-laciniate*, laciniae *sinuato-divided*, margins *connivent*, *undulate*, *smooth*, crenate at the *recurved* apices (K—C+); apothecia flesh-coloured, adnate, often dilated, margin of receptacle thin, at length excluded; spores 8, colourless, oblong, simple, small.

On the ground in alpine localities.

SYN:—Bellard Obs. Bot. 54. (1788). Nyl. Syn. 302.

FIG:—Hoffm. Pl. L. t. 66. f. 2.

EXS:—M. & N. 544. Schær. 18. Tuck. 4. Mass. 297. Anzi It. S. 50. Hepp 844. Fellm. 61.

GEOG. DISTRIB:—Europe, N. America.

BOT. PROV:—15.

SCOTLAND:—Cairngorm Mountains. *Rev. J. Dalton*. Summit of Cairntoul, Braemar. *Rev. J. M. Crombie*.

3. *P. triste*, (Web.) *pitch-black*, browner below, *subfastigiato-fruticulose*, *teretiuseculo-compressed*, *rigid*, *disticho-ramose*, branches black, attenuate, (medulla C—); apothecia fuscous-black, subterminal, appendiculate, margin dentate flexuose; spores 8, colourless, oblong, simple.

On alpine rocks.

SYN:—Weber Spicil. p. 209. (1778). Nyl. Syn. 307.

FIG:—E. Bot. 720. Web. Sp. t. 5.

EXS:—M. & N. 646. Welw. Lusit. 112. Hepp 846. Anzi It. S. 57. Schær. 256.

GEOG. DISTRIB:—Alps of Europe.

BOT. PROV:—5...7...10, 11...14, 15...18, 19.

ENGLAND :—Summit of Hedgehope, Northumberland. *Dr. G. Johnston*. Yorkshire! *Mr. Dixon*. Eglestone and Cronkley Fell, Durham. *Rev. J. Harriman*. Cheviot; Simonside, Northumberland. *Mr. Winch*. Malvern Hills, Worcestershire; Sugar Loaf, Monmouthshire. *Mr. Purton*.

SCOTLAND :—Clova Mountains. *Mr. W. Gardiner*. Morchone! and Glen Dee! Braemar, and top of Lochnagar! and near Perth. Garrynahine, Lewis. *Dr. Lindsay*. Aberfeldy, Perthshire. *Mr. Macmillan*. Ben Lawers. *Dr. Holl*.

IRELAND :—Higher Mountains, Kerry. *Dr. Taylor*.

WALES :—Cader Idris, Snowdon! *Rev. T. Salwey*. Arran Mowdddy!

4. *P. sepincola*, (Ehrh.) *castaneo-olivaceous* or *radio-castaneous* or *pallido-castaneous*, *laciniato-lobate*, *small*, *aciniis* plane, *prostrate* or *ascending*, *smooth* or *slightly lacunoso-rugulose*, *margin undulato-sinuate* or *crenate*, *paler beneath*, (K—C—); *apothecia radio-fuscescent*, *recentado rugulose beneath*, *margin entire*; *spores ellipsoid*.

On trees and palings.

SYN :—Eberhart Beitr. 2. p. 95. (1788). Nyl. Syn. 308.

FIG :—Hffm. Pl. L. t. 14. f. 1..

EXS :—Schar. 297. Hepp 843 Rabb. 741. Fellm. 63. Leight. 45.

GEOG. DISTRIB :—N. Europe, N. Asia, Arctic America.

BOT. PROV :—5...7, 8...10, 11...15...18...31.

ENGLAND :—Oteley Park pales, near Ellesmere, Shropshire. *Rev. T. Salwey*. Ingleby Park; Baysdale; Kildale; and High Cliff, Cleveland. *Mr. Mudd*, near High Force Inn, Teesdale. *Dr. Holl*. Gordon Hill; Gopsall, Leicestershire. *Rev. A. Blaxam*.

SCOTLAND :—Deerhill Wood; White Hill; Forfarshire. *Mr. W. Gardiner*. Kinnordy. *Mr. Lyell*. Morchone! Braemar; Blaeberry Hill, Perth; Garrynahine. Lewis. *Dr. Lindsay*. Quoich, Braemar; Killin; Blair Athole. *Rev. J. M. Crombie*.

WALES :—Cwm Bychan; Cessel Cwm; Drws Ardudwy. *Rev. T. Salwey*. Giant's Pebbles, Cader Idris. *Mr. Ralfs*.

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey*.

Var. *ulophylla*, (Ach.) *paler* and *larger* than *sepincola*; *laciniate*, *laciniis* variously divided, *sub-adpressed*, *margin undulato-cripsed*, *albo-sorediate*, (K—C—); *apothecia small*.

On trees, palings, &c.

SYN :—Ach. Meth. 297. (1803). Nyl. Syn. 309.

FIG :—E. Bot. 2386.

EXS :—Anzi It. S. 54. Rabb. 742. Mudd 56.

BOT. PROV :—4, 5, 10...15.

ENGLAND :—Near Yarmouth. *Mr. D. Turner*. Ingleby Park; !

Kildale!, Cleveland. *Mr. Mudd*. Oteley Park pales', Ellesmere, Shropshire. *Rev. T. Salwey*.

SCOTLAND:—Kinnordy, Forfarshire. *Sir W. J. Hooker*. Blae-berry Hill!, Perth. *Dr. Lindsay*. Scotch Mountains. *Mr. Dickson*. Linn of Quoich, Braemar; Grampians. *Rev. J. M. Crombie*.

5. *P. Fahlunense*, (L.) fuscous or spadiceo-fuscous or fusco-nigricant, orbicular, smooth, lobato-laciniate, laciniae appressed, plano-subcanaliculate, margins elevated, apices rotundato-crenate, beneath nigricant, (K medulla yellow); apothecia fuscous or fusco-rufous, receptacle plicato-rugose, margin granulose; spores 8, colourless, oblong, simple, small.

On alpine rocks.

Attention to the margins of the thallus and the spermatia will always distinguish this from *P. commixtum*, Nyl.

SYN:—Linn. Fl. Suec. 1078. Nyl. Syn. 309.

FIG:—E. Bot. 653. Hoffm. Pl. L. t. 36. f. 2.

EXS:—Hepp 586. Schaer. 373. 374. Fr. L. 8. 336. Anzi It. S. 55. 56.

GEOG. DISTRIB:—Arctic Europe, N. America, Himalaya.

BOT. PROV:—1...7...10, 11...15.

ENGLAND:—Yorkshire! *Mr. Dixon*. Teesdale; Weardale; Butsfield; Horsleyhope, Durham; Cheviot, Northumberland. *Mr. Winch*. Hay Tor, Dartmoor. *Dr. Holl*.

SCOTLAND:—Clova Mountains. *Mr. W. Gardiner*. Grampians, Braemar; Ben More, Breadalbane. *Rev. J. M. Crombie*. Ben Lawers. *Dr. Holl*.

WALES:—Llyn Cae, Cader Idris. *Rev. T. Salwey*.

### B. *Spermatia ellipsoid*.

6. *P. commixtum*, Nyl. pallido-spadiceous or spadiceo-fuscous, effuse, smooth, irregularly linear-laciniate or divided, laciniae plane ascending and entangled, margins not elevated, apices obliquely truncate and furcate, concolorous or paler beneath, (K medulla—); apothecia fuscous or fusco-rufous, receptacle plicato-rugose, margin granulose; spores 8, colourless, oblong, simple, small.

On alpine rocks.

Attention to the form of the apices of the imbricate laciniae of the thallus, and the spermatia, will at once separate this from *P. Fahlunense*.

SYN:—Nyl. Syn. 310. (1858).

FIG:—Nyl. Syn. t. 8. f. 43.



Exs :—Dicks. 23. M. & N. 350. Anzi Langob. 417. Zw. 184.

GEOG. DISTRIB :—Central Europe and Scandinavia.

BOT. PROV :—15.

LOCALITIES :—Scotch Mountains ! *Mr. Dickson*. Ben More ; Ben-na-boord ; Ben Lawers ; *Rev. J. M. Crombie*. Loch-na-gar !, Braemar. *Dr. W. L. Lindsay*. Rocks north side of Ben Lawers ! *Mr. Carroll*.

*C. Spermatia acicular cylindrical incrassate at one apex.*

7. *P. juniperinum*, (L.) *citrino-flavescent* or pale flavo-virescent or glauco-flavescent, lobato-laciniate, *laciniae eroso-crenate, crowded, crisped*, smoothish, beneath yellow, rugulose, medulla citrine (K—C+ ) ; apothecia badio-rufous or badio-fuscous, margin corrugate or crenulato-denticulate ; spores 8, colourless, oblongo-ellipsoid, simple.

On the earth and trees, in alpine districts.

SYN :—Linn. Fl. Suec. 1093. Nyl. Syn. 312.

FIG :—Hoffm. Pl. L. t. 7. f. 2. Nyl. Syn. t. 8. f. 34.

Exs :—Hepp 840. Schar. 20. Anzi It. S. 52. Langob. 371.

GEOG. DISTRIB :—N. Europe, N. America.

BOT. PROV :—15.

SCOTLAND :—Clova. *Mr. R. Jacob*. near Ben Lawers ; Rothiemurchus. *Rev. J. M. Crombie*.

Var. *pinastri*, (Scop.) like the type, but laciniae lobate, appressed and broader, *margins citrino-sorediate ; spores subglobose*.

On trees.

SYN :—Scop. Fl. Carn. 1. 387. (1760). Nyl. Syn. 312.

FIG :—E. Bot. 2111. Hoffm. Pl. L. t. 7. f. 1.

Exs :—Schar. 21. Fries. 333. Hepp 841. 842. Anzi It. S. 53. Fellm. 62. M. & N. 451.

GEOG. DISTRIB :—N. Europe, Scandinavia, Asia, N. America.

BOT. PROV :—4...11...15.

ENGLAND :—Framlingham, near Norwich. *Mr. D. Turner*. Teesdale, Durham. *Rev. J. Harriman*.

SCOTLAND :—North of Scotland ; Aviemore ; Kinnordy. *Sir W. J. Hooker*.

8. *P. glaucum*, (L.) *ivory-white or glaucescent or pallescent, membranaceous*, smooth or *slightly lacunosorugulose*, laciniate or laciniato-lobate, laciniae ascending, margins sinuate or crenate, or lacerate, or sorediate, or minutely dissecto-fimbriate, *beneath rugose, fusco-nigricant or fuscous or pallescent or entirely albicant*, (K±C=) ;

apothecia spadiceo-rufous, receptacle rugose beneath, margin thin, presently excluded.

On rocks.

SYN:—Linn. Fl. Suec. 1094. Nyl. Syn. 313.

FIG:—E. Bot. 1606.

EXS:—Nyl. 28. Bohl. 79. Mudd 54.

GEOG. DISTRIB:—Europe, America, Asia.

BOT. PROV:—1. 5. 7. 8. 10. 11. 14. 15. 16. 18. 19. 20. 31.

ENGLAND:—Lamberton Moor, Northumberland. *Dr. G. Johnston*. Craigforda, near Oswestry! *Rev. T. Salwey*. Kielder and Deadwater Fell, Northumberland. *Prof. Balfour*. Kildale Moor! Cleveland. *Mr. Mudd*. Castle Howard, Yorkshire. *Mr. Teesdale*. (1794). Malvern Hills, Worcestershire. *Mr. Purton*. Dartmoor. *Dr. Holl*. Charnwood Forest; Gopsall. *Rev. A. Bloom*. Lustleigh Cleve, Devon. *Mr. Parfitt*. Peart's Crags, near Settle. *Dr. Windsor*. Heddon-on-wall, Northumberland. *Mr. Winch*. Malvern Hills. *Mr. Purton*. Aymestry! Herefordshire; Stiperstones! Shropshire.

SCOTLAND:—Pentland Hills. *Dr. Greville*. Clova Mountains; Deerhill Wood, Forfarshire. *Mr. W. Gardiner*. Long Island; Arran: *Prof. Balfour*. Ben Mac Dhui!, Braemar; Blaeberry Hill, Perth; Amulree!, Perthshire. *Dr. Lindsay*. Killin; Rothiemurcus. *Rev. J. M. Crombie*.

IRELAND:—Mangerton. *Dr. Taylor*. Carrickadrohid. *Mr. Carroll*.

WALES:—Near Barmouth! *Rev. T. Salwey*.

CHANNEL ISLANDS:—Boulay Bay, Jersey. *Mr. Larbalestier*.

*f. sorediosa*, margins *sorediate*, fusco-nigricant and rugose beneath.

EXS:—Anzi It. S. 58. Schær. 252.

LOCALITIES:—High Cliff, Cleveland. *Mr. Mudd*. Blaeberry Hill, Perth!; Ben Mac Dhui, Braemar! *Dr. W. L. Lindsay*.

*f. fallax*, (Web.) margins entire or *sorediate*, *entirely albicant beneath*.

FIG:—Hffm. Pl. L. t. 47. f. 1—3.

EXS:—Schær. 253. Mudd 55.

LOCALITIES:—Ingleby Park, Cleveland. *Mr. Mudd*. Carlisle! *Mr. T. C. Heysham*. Inverary. *Sir W. J. Hooker*. Killin. *Rev. J. M. Crombie*.

*f. coralloidea*, Wallr. margins *minutely lineari-dissecto-fimbriate*, pallescent or albicant beneath.

FIG:—E. Bot. 2373. Hffm. Pl. L. t. 46. f. 1—3.

EXS:—Th. Fr. 30. M. & N. 156. Anzi Langob. 418. Hepp 574.

LOCALITIES:—Devonshire. *Mr. Slater*. Carig Mountain, Ireland. *Dr. Taylor*. Baldovan Woods; Clova Mountains; *Mr. W. Gardiner*.

9. *P. lacunosum*, Nyl. whitish, membranaceous, *reticulato-lacunose*, broadly *laciniate* or *lobato-laciniate*, *laciniæ crenato-undulate and incised, rotundate at the*

*apex*, beneath fusco-nigricant or fusco-pallescent or entirely whitish, (K + C—); apothecia spadiceous, receptacle rugulous beneath, margin thin entire.

On earth and trees, rare.

SYN :—Nyl. Syn. 314. (1858). *Cetraria*, Ach. Meth. 295.

FIG :—Ach. Meth. t. 5. f. 3.

EXS :—Tuck. 6. 61.

GEOG. DISTRIB :—N. America.

BOT. PROV :—15, 16.

SCOTLAND :—Ben Lawers!; Craig Cluny, Braemar. *Rev. J. M. Crombie*. Fort William, in Lochaber. *Adm. Jones*.

## SERIES IV. PHYLLODEI.

Thallus foliaceous, depressed, lobate or variously lacinate or stellate, very rarely caespitose-intricate, medulla stuppeous. Apothecia either peltiform or lecanorine or lecideine and gyrose. Spores various. Paraphyses distinct or indistinct. Spermatia shortly acicular or slenderly cylindrical, straight, narrower in the middle.

## TRIBE XI. PELTIGEREI.

Thallus frondose, dilatate, cortical layer, deficient on the under surface. Apothecia peltiform, rotundate, reniform or oblong, marginal, adnate to the upper or lower surface or scattered on the upper surface of the thallus. Spores 8, colourless and fusiform in the marginal apothecia, fuscous and ellipsoid and bilocular in the scattered apothecia. Paraphyses stout, articulate.

## SUB-TRIBE I. NEPHROMEI.

Apothecia adnate to the lower surface of the margin of the thallus. Spores 8, colourless or fuscous, 3-septate.

### I. NEPHROMIUM. *Nyl.*

Thallus membranaceous, fragile, lurid, or glaucescent or fuscous, cortical layer continuous on the lower surface, and nerveless. Granula gonima moniliform, dark cæruleo-virescent.

1. *N. lævigatum*, Ach. lurido-fuscous, orbicular, rotun-

dato-lobate, margins *sinuato-crenate*, *opaque*, *scarcely shining above*, beneath pale glabrous and slightly rugulose, (medulla white K—); apothecia fusco-rufous, margin of receptacle *crenulato-unequal*, back of receptacle *minutely depresso-granulate*; spores 8, fuscous, fusiformi-oblong, 3-septate.

On trees, rocks, and stones, in shady alpine places.

SYN:—Ach. Syn. 242. (1817). Nyl. Syn. 320. Leight. in Ann. & Mag. Nat. Hist. 4. ser. vol. 5. p. 37.

FIG:—Tul. Mém. Lich. t. 9. f. 18—23.

EXS:—Maudon 31. Leight. 107, Welw. Lusit. 12. Anzi Etr. 8. Langob. 252.

GEOG. DISTRIB:—Throughout the world.

BOT. PROV:—1...3, 4...7...12...15...31.

ENGLAND:—Keswick!, Cumberland. *Mrs. Stanger*. S. Devon and Cornwall. *Dr. Holl*. Bagley wood, near Oxford. *Mr. Baxter*. Cambridgeshire. *Rev. R. Relhan*.

SCOTLAND:—Highlands! *Baron Von Wulfen*. Blair Athole! *Prof. Dickie*. Grampians. *Rev. J. M. Crombie*. Killin. *Dr. Holl*.

WALES:—Dolgelley. *Dr. Holl*.

CHANNEL ISLANDS:—common on all the Islands. *Mr. Larbalestier*.

Var. *parile*, (Ach.) lurido-fuscescent, paler or fusconigricant and glabrous beneath, *margins crisped and ccesio-sorediate*. (medulla white K—).

SYN:—Ach. Prodr. 164. (1798). Nyl. Syn. 320. Leight. in Ann. and Mag. Nat. Hist. 1. c.

FIG:—E. Bot. 2360. Dill. Musc. t. 28. f. 105. B. & C.

EXS:—Nyl. Paris. 109. Anzi It. S. 88. Langob. 24. 253. & 254. A. M. & N. 838.

GEOG. DISTRIB:—Europe, Chili.

BOT. PROV:—1...5...7...16...30.

ENGLAND:—Hennock, near Bovey Tracey, S. Devon.! *Dr. Holl*. Cound Moor, Shropshire. *Rev. Edw. Williams*. Heavitree, Exeter. *Mr. Parfitt*.

SCOTLAND:—Appin. *Rev. J. M. Crombie*.

IRELAND:—Near Glenarm, co. Antrim. *Dr. Moore*.

WALES:—Dolgelley. *Mr. Ralfs*, near Dolgelley! *Dr. Holl*.

2. *N. tomentosum*, Hffm. livid or livido-castaneous or lurido-fuscescent, lobate or laciniato-lobate, glabrous below, tomentose upwards, under surface *pale and villose*, (medulla white K—); apothecia testaceo-rufous or rufo-fuscescent, margin protruded, annulari-tomentose, *crenulate*; back of receptacle *villose*; spores 8, colourless or fuscescent, fusiformi-oblong, 3-septate.

On trees and rocks, very rare.

SYN:—Hffm. Pl. Germ. 2. p. 108. Nyl. Syn. 319. Leight. l. c.

FIG:—Dill. Musc. t. 28. f. 105. A.

EXS:—Schær. 259. Zw. 179. M. & N. in part 252. Tuck. 13.

GEOG. DISTRIB:—Europe, N. America.

BOT. PROV —15.

SCOTLAND:—Invercauld! *Mr. R. Brown.* (1792). Craig Cluny, in Braemar. *Rev. J. M. Crombie.*

Var. *rameum*, Schær. glaucescent, broadly lobate, under surface pale and villose, albido-papillate, pseudo-cyphellate.

On trees.

SYN:—Schær. Enum. 18. (1850). Nyl. Syn. 319. Leight. l. c.

EXS:—Schær. 508.

GEOG. DISTRIB:—Switzerland.

BOT. PROV:—15.

SCOTLAND:—Forfarshire! *Mr. Dickson.*

3. *N. lusitanicum*, Schær. livido-castaneous or castaneo-fuscescent, *rotundato-lobate*, margins *crenate*, not unfrequently minutely crenulate, crisped and undulate, *smooth and somewhat shining above*, beneath pale, glabrous and somewhat rugulose, *medulla flavescens*, (*K red*); apothecia fusco-rufous, margin of receptacle *crenato-laciniate incurved*, back of receptacle *minutely depresso-arcolate*; spores 8, fuscescent, fusiformi-oblong, 3-septate.

On mossy rocks, trees, and stones, frequent.

SYN:—Schær. Enum. (1850). Leight. l. c.

EXS:—Mudd 57.

GEOG. DISTRIB:—Switzerland, Pyrenees, Portugal, Italy, Canaries, Java.

BOT. PROV:—1...5...7...10, 11, 12...15, 16...22.

ENGLAND:—Baysdale! Oggeray Gill! Cleveland. *Mr. Mudd.* Cumberland! *Mrs. Stanger.* Pentregaer! near Oswestry. *Rev. T. Salwey.* Torquay! Devon. *Dr. Deakin.* near Launceston! Cornwall; Ashburton! near Totness, Devon. *Dr. Holl.* Bickley! Devon; Liskeard!, Cornwall. *Mr. D. Turner.* Shipley Wood, Eglestone, Durham! *Mr. Robertson.*

SCOTLAND:—Carse of Ardesier, 3 m. east from Fort George!; near Cawdor!; Reeky Linn!; Craig Koynoch! *Mr. W. Gardiner.* Fort of Glenesk! Forfarshire; Crinan!, Argyshire. *Dr. Lindsay.* Falls of Moness, Aberfeldy! *Dr. Holl.* Braemar! *Mr. Croall.* Apin. *Rev. J. M. Crombie.*

IRELAND:—Shore of Lough Tay; Luggelaw! *Adm. Jones.*

WALES:—Dolgelley!; Barmouth!; Drwsynant!

## SUB-TRIBE II. PELTIDEI.

Stratum gonidiale formed of granula gonima, not



gonidia. Apothecia marginal on the upper surface of thallus. Spores 8, colourless or slightly fuscous, fusiform.

## II. PELTIGERA (*Hffm.*) *Ach.*

Thallus membranaceo-lobate, fragile, cortical layer not continuous on the under surface and there generally nerved and rhizinose.

### A. *Apothecia adnate.*

1. *P. aphthosa*, (L.) *glauco-virescent* or livido-glaucescent, broadly membranaceous, smooth, with pale brown patelliform or verrucose depressed cephalodia, beneath either reticulato-nigricanti-nervose, or continuously fusco-nigricant, with broad whitish margin; apothecia fusco-rufescent, rotundate, adnate to a narrow ascending thalline lobe; spores 8, colourless or fuscous, fusiform, 3-7-septate.

On shady alpine rocks.

SYN:—Linn. Fl. Suec. 1098. Nyl. Syn. 322.

FIG:—E. Bot. 1119. Nyl. Syn. t. 8. f. 38.

EXS:—Tuck. 9. 102. M. & N. 251. Mudd 58. Mass. 12. Anzi It. S. 90. Hepp 173. Schær. 29.

GEOG. DISTRIB:—N. Europe, N. Asia, N. America.

BOT. PROV:—5...7, 8...11...14, 15...30.

ENGLAND:—Craigforda; and Downton Castle, Herefordshire. *Rev. T. Salwey*. Cheviots, above Langley Ford; Gunnerton Crags; Shewing Shields, Northumberland; Hagerag Wood in Teesdale Forest, Durham. *Mr. Winch*. Holwick. *Rev. J. Harriman*. near Buxton. *Dr. Holl*.

SCOTLAND:—Foot of Pentland Hills. *Mr. Yaldon*. near the Falls of the Clyde, in fruit. *Messrs Turner & Hooker*. near Habbie's How, in the Pentland Hills. *Dr. Greville*. Abbey St. Bathans! *Dr. G. Johnstone*. Sands of Barrie and west side of the White Hill, Forfarshire, in fruit. *Mr. W. Gardiner*. Blair Athole. *Rev. J. M. Crombie*.

WALES:—Lake at Llyn Bodlyn. *Rev. T. Salwey*.

IRELAND:—Sallagh Braes, near Belfast. *Mr. Templeton*. co. of Derry. *Mr. D. Moore*.

1. *P. canina*, (L.) *canescent* or cinereo pallescent, opaque, more or less longitudinally lacunoso-impressed, adpresso-tomentellose, rotundato-lobate, under surface albedo-adpresso-tomentose, and reticulated with prominent slender pale tomentose nerves, from which issue long

*tomentose rhizinæ*; apothecia fuscous or fusco-rufous, adnate, margin nearly entire, back of receptacle uniformly tomentose; spores 8, colourless, elongato-fusiform, 3-5-septate.

On mossy earth, stones, &c. very common.

SYN:—Linn. Fl. Suec. 1109. Nyl. Syn. 324.

FIG:—E. Bot. 2299.

EXS:—Tuck. 103. Leight. 141. Hepp 365. Anzi It. S. 91. 92. Fellm. 68. Bohl. 30. Mudd 59. M. & N. 154.

GEOG. DISTRIB:—Europe, Asia, Africa, N. and Central America.

BOT. PROV:—1...3, 4, 5...7...11...15, 16...(19—30). 31.

ENGLAND:—Berwick-upon-Tweed! *Dr. G. Johnstone*. Worcester! *Dr. Holl*. Northumberland and Durham. *Mr. Winch*. Kelvedon, Essex. *Mr. Varenne*. Devonshire. *Mr. Parfitt*. Midland Counties. *Mr. Purton*. Bedfordshire. *Rev. C. Abbot*.

SCOTLAND:—Forfarshire. *Mr. W. Gardiner*. Long Island; Arran. *Prof. Balfour*. Ben Lawers! *Dr. Holl*.

IRELAND:—Common. *Mr. Carroll*.

N. WALES:—Dolgelley! *Dr. Holl*.

CHANNEL ISLANDS:—Common on all the Islands. *Mr. Larbalestier*.

Varies with a thinner more glabrous thallus = *membranacea* (Ach.); and with sorediate margins = *crispa* (Whlnb.) Leight. Exs 262.

3. *P. rufescens*, (Hffm.) pale cervine or cinereo-rufescent, rotundato-lobate, smooth, glabrous, under surface with thick coarse spongioso-tomentose fuscous nerves and interstitial longitudinal whitish lacunæ, rhizinæ few; apothecia fuscous or rufo-fuscous, margin minutely denticulate, back of receptacle subverrucoso-tomentose.

On mossy earth &c. not common.

SYN:—Hffm. Fl. Germ. 2. p. 107. Nyl. Syn. 324.

FIG:—E. Bot. 2300.

EXS:—Zw. 180. Spruce Amaz. 57.

GEOG. DISTRIB:—Europe, Asia, N. America, N. Zealand.

BOT. PROV:—1...5...11...13, 14, 15, 16, 17, 18...20, 21...31.

ENGLAND:—Berwick-upon-Tweed! *Dr. G. Johnston*. near Worcester! *Dr. Holl*. Gunneton Crags, near Barweford; Shewing Shields, Northumberland; Teesdale and Healey Field, Durham. *Mr. Winch*. Lustleigh Cleve, Devon. *Mr. Parfitt*. Midland Counties. *Mr. Purton*.

SCOTLAND:—Common. *Rev. J. M. Crombie*.

IRELAND:—Rosscarbery, Cork; Ballynagarde, Limerick. *Mr. Carroll*.

CHANNEL ISLANDS:—Guernsey. *Rev. T. Salwey*. Jersey. *Mr. Larbalestier*.

4. *P. spuria*, (Ach.) cinereo-virescent, small, digitato-

lobate, lobes ascending, smooth, glabrous in the lower part, adpresso-tomentellose upwards towards the apothecia, under surface whitish with thick coarse spongioso-tomentose nerves and interstitial longitudinal whitish lacunae; apothecia fuscous or rufo-fuscous, roundish, margin irregularly crenulate or denticulate, back of receptacle densely irregularly spongioso-tomentose; spores 8, aciculari-fusiform, 3-7-septate.

On the earth, rare.

SYN:—Ach. Prodr. 159. (1798.) Nyl. Syn. 325.

FIG:—E. Bot. 1542.

EXS:—Hopp 576. Spruce Amaz. 56. Fellm. 70. M. & N. 837.

GEOG. DISTRIB:—Europe, Australasia.

BOT. PROV:—1, 2, 3, 4, 5...7...11...15...31.

ENGLAND:—Sussex and Suffolk. *Sir W. J. Hooker*, near Berwick-upon-Tweed. *Dr. G. Johnston*, Oswestry, Shropshire. *Rev. T. Salwey*, near Totness; Shanklin Downs, Isle of Wight! *Dr. Holl*, Kelvedon, Essex. *Mr. Varenne*, Exwick, Devon. *Mr. Parfitt*.

SCOTLAND:—Trossachs; Blair Athole. *Rev. J. M. Crombie*.

WALES:—Ynysiaig. *Rev. T. Salwey*.

CHANNEL ISLANDS:—Guernsey. *Rev. T. Salwey*.

5. *P. polydactyla*, Hffm. glauco-pallescent or pallido-fuscescent, digitato-lobate, lobes ascending, glabrous and shining, smooth or obsoletely impressed, beneath with thick coarse spongioso-tomentose fusco-nigricant anastomosing more or less flattened nerves, and interstitial longitudinal whitish lacunae; apothecia fuscous or fusco-rufescent, longitudinal, margin irregularly crenulate, back of receptacle sub-rufescens-tomentose; spores 8, colourless, attenuato-fusiform, 3-7-septate.

On mossy earth &c. rare.

SYN:—Hffm. Fl. Germ. 2. 106. (1795). Nyl. Syn. 326.

FIG:—Hffm. Pl. L. t. 4. f. 1.

EXS:—Bohl. 56. & 71. Tuck. 10. Schar. 30. Mass. 260. M. & N. 633. Anzi It. S. 94. Mudd. 61. Leight. 172.

GEOG. DISTRIB:—Europe, Asia, Africa, Polynesia, Australasia.

BOT. PROV:—1...5...11... 14, 15, 16...(19—30), 31.

ENGLAND:—Oswestry and Ludlow, Shropshire. *Rev. T. Salwey*, near Eglestone, and on banks of the Derwent near Gibside, Durham. *Mr. Winch*, Alphington; Stoke Wood, Devon. *Mr. Parfitt*.

SCOTLAND:—Wall at Craighouse near Edinburgh. *Dr. Greville*, Forfarshire. *Mr. W. Gardiner*, Long Island; Arran. *Prof. Balfour*, near Aberdeen; Braemar; Blair Athole; Killin; Lorne. *Rev. J. M. Crombie*.

IRELAND:—Not unfrequent. *Mr. Carroll*.

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey*. Jersey. *Mr. Larbalestier*.

6. *P. scutata*, (Dicks.) virescenti-cinereous, spreading, oblongo-lobate, upper surface glabrous below, minutely depresso-granulate upwards, margins undulato-crenate crisped and cæcio-soresediate, under side with pale brown spongioso-tomentose flattened anastomosing nerves and interstitial white lacunæ ; apothecia fuscous or fusco-rufescent, adnate, suborbicular, margin irregularly crenulate, back of receptacle spongioso-tomentose ; spores 6-8, colourless, acicular or elongato-fusiform, 3-septate.

On mossy earth and trees, rare.

SYN :—Dicks. Crypt. fasc. 3. 18. (excl. syn.) (1793.) Nyl. Syn. 327.

FIG :—E. Bot. 1834.

EXS :—Anzi Langob. 25. Spruce Amaz. 416. M. & N. 541.

GEOG. DISTRIB :—Europe, N. America.

BOT. PROV :—1...5...7...11, 12...15.

ENGLAND :—Westmoreland. *Sir J. E. Smith*. Pentregaer near Oswestry, Shropshire ! *Rev. T. Salwey*. Kielder and Dead Water Fell, Northumberland. *Prof Balfour*. South Brent, Devon ! Ivy Bridge, S. Devon ! *Dr. Holl*. Lustleigh Cleve, Devon. *Mr. Parfitt*.

SCOTLAND :—Scotland. *Mr. Dickson*. Inverary. *Messrs. D. Turner & Hooker*. Clova. *Mr. W. Gardiner*. Ardtur. *Capt. Carmichael*. near the Rae Hills. *Sir W. Jardine & Dr. Greville*. Rumbling Bridge. *Prof. Balfour*. Killin, Perthshire ! *Dr. Holl*. Trossachs. *Rev. J. M. Crombie*.

WALES :—Hafod, Cardiganshire. *Sir J. E. Smith*. Corsygedol and Llyn Bodlyn. *Rev. T. Salwey*. Nannau, near Dolgelley ! *Dr. Holl*.

### B. *Apothecia horizontal*.

7. *P. horizontalis*, (L.) pale or pallido-fuscescent or glauco-pallescent, rotundato-lobate, glabrous, smooth or slightly impressed, shining, margins sinuato-crenate and slightly undulate ; under surface with pale brown and fuscous-black coarse flattened anatomosing or confluent nerves and interstitial white lacunæ ; apothecia fuscous or fuscous-black, rotundate or elliptical, plane, horizontal ; margins irregularly crenulate, often inflexed, back of receptacle verrucoso-tomentose ; spores 6-8, colourless, or pale fuscescent, fusiform, 3-septate.

On mossy rocks, trees, and walls, not common.

SYN :—Linn. Mant. 132. (1771.) Nyl. Syn. 327.

FIG :—E. Bot. 888. Tul. Mém. t. 8. f. 414. Nyl. Syn. t. 8, f. 39.



Exs :—Bohl. 37. Schær. 27. Breutel 118. Nyl. 110. Tuck. 11. 12 M. & N. 345. Mudd 62. Maud. 27. Mass. 214. Leight. 108. Anz It. S. 93. Hepp 852.

GEOG. DISTRIB :—Europe, N. America.

BOT. PROV :—2...5... 7, 8...10, 11, 12...14, 15, 16... 19, 20...30.

ENGLAND :—Bardon Hill, Leicestershire. *Rev. A. Bloxam*. Keswick, Cumberland, *Mrs. Stanger*. Yorkshire! *Mr. G. Dixon*. Stogdale! and Oggeray Gill! Cleveland. *Mr. Mudd*. Craigforda, Oswestry, Shropshire; Wickeliff Rocks, Ludlow. *Rev. T. Salwey*. Gunnerton Crags; Cheviots above Langley Ford, Northumberland; Hagerag Wood in Teesdale Forest and Healey Field, Durham. *Mr. Winch*. St. Leonard's Forest, Sussex. *Mr. Larbalestier*. Lilleshall Abbey, Shropshire. !

SCOTLAND :—Loch Tay, Perthshire! and Aberfeldy road. *Dr. Lindsay*. Berwickshire! *Dr. G. Johnston*. Forfarshire. *Mr. Gardiner*. Arran. *Prof. Balfour*. Breadalbane, Appin and Lochaber. *Rev. J. M. Crombie*.

WALES :—Aber. *Rev. H. Davies*. valley above Halfway House, between Barmouth and Dolgelley. *Rev. T. Salwey*.

IRELAND :—Lota Wood, Cork. *Mr. J. Carroll*. near Killarney. *Dr. Taylor*. Derry and Antrim. *Dr. Moore*.

8. *P. venosa*, (L.) pale or pallido-cinereous or glaucocinerascent, *small, simple, sub-ascending* or sub-erect, *flabelliformi-lobate, smooth and glabrous, albo-tomentose beneath, with strong black or fuscous-black nerves ramifying from the base*; apothecia fuscous-black, rotundate, plane, *horizontal*, disk rough and granular, margin *striato-crenulate*; back of receptacle *nigro-tomentose*; spores 6-8, colourless or pale fuscous, fusiform, 3-septate.

On the earth, rare.

SYN :—Linn. Fl. Suec. 1097. (1755.)

FIG :—E. Bot. 887. Hfm. Pl. L. t. 6. f. 2.

Exs :—Hepp 172. Schær. 27. M. & N. 153. Mass. 17. Anzi It. S. 95.

GEOG. DISTRIB :—N. Europe, N. Asia, N. America.

BOT. PROV :—5...13, 14, 15...30.

ENGLAND :—Whitecliff Rocks, near Ludlow, Shropshire!

SCOTLAND :—Foot of Ben Lawers! and Birks of Aberfeldy. *Mr. Hugh Macmillan*, near Killin, Perthshire! *Dr. Gilchrist*. Ben Lawers! *Mr. J. Carroll*. Pass of Killiecrankie, Perthshire. *Rev. J. Dalton*. Glen Kill Linn and Burn, Dumfriesshire. *Dr. Burgess*. Blair in Athole. *Messrs. Borrer & Hooker*. Habbies How in the Pentland Hills. *Dr. Greville*. Reeky Linn; Foot of the White Hill above Auchterhouse, Forfarshire. *Mr. W. Gardiner*. West Water, near Old Castle of Edgell. *Mr. A. Croall*.

IRELAND :—Knockagh Hills, co. Antrim. *Mr. D. Moore*.



## SUB-TRIBE III. SOLORINEI.

Thallus membranaceous, opaque, stratum gonidiale consisting of granula gonima, not gonidia. Apothecia innate, scattered on the upper surface of thallus. Spores fuscous, bilocular.

III. SOLORINA, *Ach.*

Thallus fragile, cortical layer not continued over the under surface, which is obsoletely nervose. Apothecia rotundate or oblong, spadiceo-rufescent or fuscous black. Stratum gonimon bright green.

1. *S. crocea*, (L.) *coriaceous*, cinnamomeo-or rufescenti-cinerascent, (dark green when moist) orbicular, laciniatolobate, lobes rotundo-obovate, margin undulate, *appressofurpuraceous below, smooth upwards, under surface deep orange-coloured, appresso-tomentose, subpalmato-nervose*; apothecia fuscous or fusco-rufescent, roundish, *adnate, plane, subtumid, immarginate*; spores 8, pallido-rufescent, *fusiiformi-ellipsoid*, 1 septate.

On the ground in alpine localities, rare.

SYN:—Linn. Fl. Suec. 1101. (1755.) Nyl. Syn. 329.

FIG:—E. Bot. 498. Hfm. Pl. L. t. 41. f. 2—4. & t. 42. f. 4. 5. Nyl. Syn. t. 8. f. 40.

EXS:—Hepp 577. Th. Fr. 5. Schaer. 24. Rabh. 767. Anzi It. S. 86. Fellm. 72.

GEOG. DISTRIB:—Europe, Asia.

BOT. PROV:—14, 15...19.

SCOTLAND:—Forfarshire. *Mr. Don*. Edinburgh. *Mr. Mackay*. top of Ben Lawers! *Dr. Burchell & Fr. Lindsay*. on all the Breadalbane Mountains at 3000 ft. as Ben More! Ben Challum, Craig Challeach, back of Craig na Gour, &c. *Mr. A. McKinlay*. summits of the Highland Mountains, Ben Lomond, &c. *Sir W. J. Hooker*. summits of Bassies, White Bent, &c., Clova. *Mr. W. Gardiner*. Peak of Mamsoul, Invernessshire. *Dr. B. White*. Ben Lomond; Morrone. *Rev. J. M. Crombie*.

IRELAND:—On Brandon, Kerry. *Dr. Moore*.

2. *S. saccata*, (L.) *membranaceo-papyraceous*, pallido-fuscescent (bright green when moist), orbicular, rotundolobate, margins broadly and shallowly crenate, *smooth below, albo-granulato-pruinose upwards*; under surface *paler, appresso-spongioso-tomentose, rhizinoe*; apothecia fuscous or nigro-fuscous, *urceolato-appressed*; spores 4, rufo-fuscescent, *ellipsoid*, 1-septate.

On the ground in moist shady alpine localities, not common.

SYN:—Linn. Fl. Suec. 1102. (1755.) Nyl. Syn. 330.

FIG:—E. Bot. 288. Schaer. En. t. 2. f. 5. Journ. Linn. Soc.; Bot 9, t. 2. f. 8.

EXS:—Nyl. 29. Hepp 171. Schaer. 25. Mudd 63. M. & N. 61. Mass. 126. Anzi It. S. 85. Bohl. 4. Dicks. 25.

GEOG. DISTRIB:—Europe, N. America.

BOT. PROV:—3, 4, 5, 7, 8...10, 11...15, 16...19...27.. 30.

ENGLAND:—N. W. Yorkshire; near Matlock, Derbyshire; *Sir J. E. Smith*. Cambridgeshire. *Rev. R. Bellan*. Falcon Clints and White Force, Teesdale, Durham!; Kildale, Cleveland! *Mr. Mudd*. Studley Park, Yorkshire. *Mr. W. Branton*. St. Vincent's Rocks, Bristol. *Miss M. Atwood*. Ingleborough. *Mr. J. G. Baker*. Weardale! *Sir W. C. Trevelyan*. Cheddar and St. Vincent's Rocks. *Messrs. Turner & Sowerby*. Middleton-in-Teesdale, Durham. *Mr. Winch*. near Buxton. *Dr. Holl*. Via Gellie, Derbyshire. *Rev. A. Bloom*. Headington, Oxford. *Mr. Baxter*. White-cliff Rocks, near Ludlow, Shropshire!

SCOTLAND:—Ben Lawers. *Mr. H. Macmillan*. Highlands of Scotland. *Sir W. J. Hooker*. Inchnadamff! *Sir W. C. Trevelyan*. Glen Dole, Canlochan; Glen Prosen; Reeky Linn, Forfarshire. *Mr. W. Gardiner*. near Killin. *Dr. Holl*. Morrone; Craig Tulloch; Finlarig, Killin; Appin. *Rev. J. M. Crombie*.

WALES:—Anglesea. *Rev. H. Davies*.

IRELAND:—On Brandon Hill, Kerry; Ben Bulbin, Sligo. *Mr. J. T. Mackay*. Cushendall, Antrim. *Dr. Moore*.

3. *S. limbata*, (Sommf.) *subcoriaceous*, fuscous, dark-green and gelatinous when moist, *granulato-plicato-squamulose*, *albo pruinose*; apothecia fuscous or nigro-fuscous, *large*, *uneculate*, *bordered by a plane expanded crenate albo-furfuraceous granulate margin*; spores 4, *rufo-fuscous*, *broadly and obtusely oblong*, 1-septate.

On the earth among wet mossy rocks, rare.

SYN:—Sommf. Fl. Lapp. 105. (1826.) Nyl. Syn. 331.

FIG:—E. Bot. 1374. Sommf. Fl. Lapp. t. 3. f. 1--9. Journ. Linn. Soc. Bot. 9, t. 2. f. 9. & 10.

EXS:—Anzi Laurab. 46.

GEOG. DISTRIB:—Scandinavia, Europe, N. America.

BOT. PROV:—4...10, 11...15...30.

ENGLAND:—Durham. *Rev. J. Harriman*. Ayton, Cleveland! *Mr. J. G. Baker*. Cambridge! *Mr. G. Bentham*. Ingleborough. *Dr. Carrington*. Guisbro' Moor, Cleveland. *Mr. Mudd*.

SCOTLAND:—Ben Lawers. *Dr. Holl*.

IRELAND:—Head of Glenarriff, co. Antrim. *Dr. Holl*.

## TRIBE XII. PARMELIEI.

Thallus frondoso-dilutate or lobate or lobato-laciniate

or stellato-laciniate, sometimes somewhat terete, and fruticulososo-imbricate. Apothecia lecanorine or in a cupuliform receptacle. Sterigmata pluri-articulate or with arthrosterigmata.

### SUB-TRIBE I. STICTEI.

Thallus membranaceo-lobate, the under surface rhizino-se, and with pulverulent pseudo-cyphellæ or true urceolate cyphellæ. Apothecia with distinct paraphyses. Spores fusiform, 1—3 rarely pluri-septate.

### I. STICTINA. *Nyl.*

Thallus variously lobed or laciniato-lobate. Rhizinæ simple. Stratum gonidiale consisting of granula gonioma of a dark blue-green colour.

#### A. *Pseudocyphellæ* white.

1. *S. intricata*, (Del.) the typical species figured in Delise's *Stictæ*, t. 7. f. 33. has not been observed in Great Britain.

Var. *Thouarsii*, (Del.) coriaceous, pallido-fuscescent, sinuato-lobate, lobes short and broad, with casious-white soredia scattered over the surface, and especially on the margins, under surface tomentose nigro-fuscescent, paler brown towards circumference; apothecia not found.

On trees and rocks, rare.

SYN:—Del. St. p. 90. (1822). *Nyl.* Syn. 335. Mudd Man. 90.

FIG:—Del. St. t. 8. f. 29.

GEOG. DISTRIB:—Africa, Central America, Java.

BOT. PROV:—1...7...15.. 19...21.. 30.

ENGLAND:—Near Hay Tor, Dartmoor. *Dr. Holl.*

SCOTLAND:—Inverary. *Adm. Jones.* Ben Lawers. *Rev. J. M. Crombie.*

IRELAND:—Brandon Mountains; Glenarm. *Dr. Moore.* Cromaglow. *Mr. Carroll.* Fenagh, co. Carlow. *Adm. Jones.*

N. WALES:—Arthog, near Dolgelley. *Rev. T. Salwey.*

#### B. *Pseudo-cyphellæ* yellow.

2. *S. crocata*, (L.) lurido-fuscescent, shining, broadly rotundo-lobate, crenate, reticulato-lacunose, reticulations and margins bearing citrine soredia, under side fusco-

nigricant, tomentose; apothecia scattered, blackish, margins crenate, at length excluded; spores 6—8, fuscous, oblongo-fusiform, 1-septate.

On trees, mosses, &c. very rare.

SYN:—Linn. Mant. 310. (1771).

FIG:—E. Bot. 2110.

EXS:—Tuck. 65.

GEOG. DISTRIB:—Spain, W. & Central Africa, America, Java, N. Holland.

BOT. PROV:—1...14, 15...19...30.

ENGLAND:—Dartmoor. *Rev. J. M. Crombie.*

SCOTLAND:—Highland Mountains. *Mr. Dickson.* Glen Morriston, Invernessshire. *Messrs Turner, Hooker, & Greville.* Inverary! *Messrs. Borrer & Hooker.* Ben Lawers! Birks of Aberfeldy, *Mr. Macmillan.* rocks east of Dalmahoy Hill, near Edinburgh. *Dr. Maingay.* Glen Falloch. *Dr. Holl.*

IRELAND:—Fairbread co. Antrim. *Mr. Templeton.* Pigeon Island in the River Kenmare. *Dr. Taylor.* near Cushendall, co. Antrim. *Dr. Moore.*

### *C. Cyphellæ urceolate.*

3. *S. limbata*, (Sm.) pale cervino-rufescent, monophyllous, rotundo-lobate, smooth and unequal, margins densely and copiously cæcio-soresediate, under surface pale brown, tomentose; apothecia not seen.

On mossy shady rocks and trees, rare. 1745.

SYN:—Sm. E. Bot. 1104. (1802).

FIG:—E. Bot. 1104.

EXS:—Larb. 15. Schær. 557. Welw. Lusit. 3.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1, 2, 3...5, 6, 7...11...14, 15...19. 30, 31.

ENGLAND:—Bagley Wood, near Oxford. *Dillenius.* (1745). Quan Wood, near Ryde, Isle of Wight! *Rev. A. Bloxam.* Ham-bury Gill, Teesdale, Durham. *Rev. J. Harriman.* near Exeter, Devon. *Mr. E. Parfitt.* Hay Coppice, Herefordshire. *Rev. T. Salwey.* Eglestone, Durham; Cheviots above Langley Ford, Northumberland. *Mr. Winch.* Torquay. *Dr. Holl.* Heavitree, Devon. *Mr. Parfitt.*

SCOTLAND:—Braid Hermitage, near Edinburgh. *Sir J. E. Smith.* Glen Nevis, Invernessshire; Lochaber. *Dr. Lindsay.* Birks of Aberfeldy. *Mr. Macmillan.* Loch Lomond and Falls of the Clyde. *Messrs Turner & Hooker.* near Balmuto. *Dr. Greville.* Clova. *Mr. G. Don.* Killin. *Dr. Holl.*

IRELAND:—Near Cork, and near Muckcross, Killarney. *Mr. J. Carroll.* near Belfast. *Mr. Templeton.* near Bantry. *Miss Hutchins.* Killarney. *Dr. Carrington.* Glenarm. *Dr. Moore.*

WALES:—Hafod. *Sir J. E. Smith.* Snowdon. *Mr. D. Turner.*

Corsygedol and Abergwynant. *Rev. T. Salwey*. Gloddaeth near Conway! Dolgelley!, Barmouth.

CHANNEL ISLANDS:—Rozel, Jersey! *Mr. Larbalstier*. Jerbourg, Guernsey. *Rev. T. Salwey*.

4. *S. fuliginosa*, (Dicks.) cervine or cinereo-fuscescent, monophyllous, scrobiculate, unequal, rotundo-lobate, covered with dark isidiose efflorescence, under surface pale brown tomentose; apothecia scattered, rufescent, piloso-ciliate; spores 6-8, colourless, fusiform, 1-3-septate.

On rocks and trees in alpine localities, rare. 1785.

SYN:—Dicks. Cr. Br. 1. 13. (1785). Nyl. Syn. 345.

FIG:—E. Bot. 1103.

EXS:—Welw. Lusit. 7. Schaer. 386. Nyl. 30. Zw. 224. Anzi It. S. 97. M. & N. 542. Larbal. 61.

GEOG. DISTRIB:—Europe, Africa, America, N. Zealand.

BOT. PROV:—1.. 5, 6, 7...12, 13...15, 16...19...31.

ENGLAND:—Ambleside, Westmoreland. *Sir J. E. Smith*. Rockwood Grove, Bocombe, Cornwall. *Mr. E. Foster*. Castellet rocks, Keswick, Cumberland! *Mrs. Stanger*. Launceston; Bodmin. *Messes Turner & Sowerby*. South Brent, Devon. *Dr. Hall*. Moreton, Devon. *Mr. Parfitt*. Whitecliff rocks, near Ludlow, Shropshire!

SCOTLAND:—Crinan Canal, Argyshire! and Glenesk, Forfarshire! *Dr. Lindsay*. Coill-dh'ue, near entrance of Glenlyon. *Mr. Macmillan*. near Dumfries (in fruit). *Dr. Richardson*. Falls of the Clyde, and near Inverary and Pallycheulish. *Messes Turner & Hooker*. Bold Craig, Moffat. *Dr. Nichol*. Langton Lees, Cleuch! *Sir W. C. Trevelyan*.

IRELAND:—Roadside between Kenmare and Killarney. *Dr. Taylor*. Killarney. *Dr. Carrington*.

WALES:—Hafod, Cardiganshire. *Sir J. E. Smith*. Garth Woods and Cwm Bychan. *Rev. T. Salwey*. Aber Valley; Aberdovey: near Bangor. *Rev. A. Blocom*. Barmouth and near Dolgelley, N. Wales!

CHANNEL ISLANDS:—Guernsey. *Rev. T. Salwey*. Sark! Bonne Nuit Bay; Havre Giffard; La Coupe, Jersey! *Mr. Larbalstier*.

5. *S. sylvatica*, (L.) cervine or cinereo-fuscescent, scrobiculate, unequal, laciniato-lobate, furfuraceous above; apothecia scattered, margin naked.

On mossy rocks &c.

SYN:—Linn. Sp. Pl. No. 65. (1753). Nyl. Syn. 348.

FIG:—E. Bot. 2298.

EXS:—Schaer. 258. M. & N. 155. Nyl. 111. Hepp 868. Anzi It. S. 96.

GEOG. DISTRIB:—Europe, N. America.

BOT. PROV:—1.. 5, 6...11...15, 16...19.

ENGLAND:—Oswestry, Shropshire! Hay Coppice, Herefordshire. *Rev. T. Salwey*. Kielder and Deadwater Fell, Northumberland. *Prof. Baljourn*. Cawsey, Eglestone and Blackstone Bank Woods,



Durham; Cheviots above Langley Ford and East Common Wood, Northumberland. *Mr. Winch.* near Bigbury, S. Devon. *Dr. Holl.* Budleigh Salterton, Devon. *Dr. Dickie.*

SCOTLAND:—Killin. *Dr. Holl.* Falls of Moness, Perth. *Lady Wilson.* Birks of Aberfeldy. *Mr. H. Macmillan.* Drumlanrig Wood. *Mr. W. Stevens.* Braemar. *Mr. A. Croall.* Falls of the Clyde. *Mr. Hopkirk.* Inverary and Ballacheulish. *Messrs Turner & Hooker.* Appin and Lochaber; Inverary. *Rev. J. Crombie.* Reeky Linn, Forfarshire. *Mr. W. Gardiner.* Newhall, North Esk, near Carlops; Glen Queich, Ochils. *Dr. Nichols.*

IRELAND:—Blackwater Bridge, co. Kerry. *Dr. Taylor.*

N. WALES:—Barmouth! *Rev. T. Salwey.* near Dolgelley. *Dr. Holl.* Aber Valley; Rhewgreidden. *Rev. A. Bloxam.*

6. *S. Dufourei*, (Del.) glaucescent or glauco-fuscescent, *smooth*, margins of laciniae *minutely dissecto-fimbriate*, under surface pallescent, slightly tomentose or nearly naked; apothecia not seen.

On mossy rocks and trees, rare.

SYN:—Del. St. p. 78. (1826). Nyl. Syn. 348. *St. ciliata.* Tayl. Mack. Fl. Hib. 2. 152.

FIG:—Del. St. t. 6. f. 22.

EXS:—Leight. 173. Welw. Lusit. 5.

GEOG. DISTRIB:—Europe, Canaries, Madeira.

BOT. PROV:—1...16...19.

ENGLAND:—Rock Walk, Ilsham near Torquay. *Dr. Deakin.* near South Brent, Devon. *Dr. Holl.*

SCOTLAND:—Appin. *Rev. J. M. Crombie.*

IRELAND:—Killarney. *Mr. Carroll & Dr. Carrington.* Askew Wood, co. Kerry. *Dr. Taylor.*

### *D. Ecyphellate, bullate.*

7. *S. scrobiculata*, (Scop.) glauco-flavescent, *reticulato-scrobiculate*, *sorediate*; under surface tomentose fuscescent *albido bullate*; apothecia scattered, margin thick entire inflexed; spores 8, colourless, fusiform, 3-7-septate.

On trees, rare. 1794.

SYN:—Scop. Carneol. p. 384. (1772.) Nyl. Syn. 353.

FIG:—E. Bot. 497. Hffm. Pl. L. t. 1. f. 1.

EXS:—Leight. 201. Hepp 592. Mudd. 65. M. & N. 444. Fellm. 74. Schær. 490. Welw. Lusit. 6. Larb. 14. Anzi Etr. 47.

GEOG. DISTRIB:—Europe, Asia, N. America.

BOT. PROV:—1, 2.. 5 ..7, 8...10, 11, 12...15...19...31.

ENGLAND:—Concey Thorpe Banks, Castle Howard, Yorkshire. *Mr. Treesdale.* (1794). Keswick, Cumberland! *Mex. Stanger.* Oggeray Gill, Yorkshire! *Mr. Mudd.* Charnwood Forest, Leicestershire! Quarn Wood, Ryde, Isle of Wight! *Rev. A. Bloxam.* Egglestone, Durham. *Rev. J. Harriman.* near Ripon, Yorkshire. *Mr. W. Brunton.*

Exeter, Devon. *Mr. Parfitt*. Penmanshiel Wood ! Bodmin and Liskeard. *Messrs Turner and Sowerby*. Rawse Castle ! near Longformacus ! Berwick-on-Tweed. *Dr. Johnston*. Hay Coppice, Herefordshire. *Rev. T. Salwey*. Cheviot above Langley Ford, Northumberland ; Shipley Wood near Egglestone ; near the High Force, Teesdale ; Waskerley Bourn near Wolsingham, Durham. *Mr. Winch*. near Ivy Bridge, South Devon. *Dr. Holl*. Plymouth ; Torquay ; Ansty Cove, &c., Exeter. *Mr. Parfitt*. Midland Counties. *Mr. Purton*. Kielder and Deadwater Fell, Northumberland. *Prof. Balfour*.

SCOTLAND :—Ben Nevis ! *Dr. Lindsay*. Pentland Hills. *Mr. Maughan*. Clova ; Reeky Linn ; Lundie Craigs ; sands of Barrie. *Mr. W. Gardiner*.

IRELAND :—Near Bantry. *Miss Hutchins*. Killarney. *Dr. Carrington*.

WALES :—Corsygedol and Abergwynant. *Rev. T. Salwey*. Rhaiadr Du near Dolgelley. *Dr. Holl*.

CHANNEL ISLANDS :—La Coupe, Boulay Bay, Jersey ! *Mr. Larbalestier*. Jerbourg, Guernsey ; *Rev. T. Salwey*.

## II. STICTA. (*Ach. pr. p.*)

Thallus variously lobed or laciniato-lobate. Rhizinae simple. Stratum gonimon consists of true gonidia of a yellow-green colour.

*A. Ecyphellate, bullato-reticulato-tomentose beneath.*

1. *S. pulmonacea*, Ach. pallido-cervine, reticulato-foveolate, laciniato-lobate, sinuate, truncate, under surface reticulato-tomentose, bullate ; apothecia marginal, margin rugulose, crenulate ; spores colourless, oblongo-fusiform, 1-3-septate.

On trees.

SYN :—Ach. L. U. p. 449. (1810). Nyl. Syn. 351. Hffm. Pl. L. t. 1. f. 2. Nyl. Syn. t. 8. f. 44.

FIG :—E. Bot. 572.

EXS :—Welw. Lusit. 2. Mass. 38. Hepp 591. Schaer. 384. M. & N. 62. Anzi It. S. 98.

GEOG. DISTRIB :—Europe, Africa, Asia, America, Australasia.

BOT. PROV :—1, 2, 3, 4, 5...7, 8...10, 11, 12...15...19...31.

ENGLAND :—Camelford ; Launceston. *Messrs Turner & Sowerby*. Charnwood Forest, Leicestershire ! *Rev. A. Bloxam*. Coppice near Ludlow ; Pentregaer near Oswestry ; *Rev. T. Salwey*. Keswick, Cumberland ; *Mrs. Stanger*. Stogdale, Cleveland ! *Mr. Mudd*. Ripon, Yorkshire. *Mr. W. Branton*. Boltby near Thirsk. *Mr. J. G. Baker*. Hilsks Woods, Ingleborough. *Dr. Carrington*. Harpford Wood, Devonshire. *Miss M. Atwood*. Longformacus ! *Dr. G. Johnston*. Kielder and Deadwater Fell, Northumberland. *Prof. Balfour*.

near Northank and Rothbury, and Cheviot above Langley Ford, Northumberland; Blackstone Bank Wood near Wolsingham; near Eglestone and Middleton-in-Teesdale, Durham. *Mr. Winch.* between Heatley Field and Allansford, Durham. *Mr. Thornhill.* near Totness, South Devon; Isle of Wight. *Dr. Holl.* Teignmouth; Budleigh Salterton, Devon. *Mr. Parfitt.* Coleshill, Warwickshire. *Rev. W. T. Bree.* Bagley Wood near Oxford. *Mr. Baxter.* Gloucestershire. *Mr. Purton.* Bedfordshire. *Rev. C. Abbot.* Cambridgeshire. *Rev. R. Relhan.*

SCOTLAND:—Inverary! *Mr. W. Wilson.* Barncluith near Glasgow. *Mr. Hopkirk.* Beld Craig, Moffat. *Dr. Nichol.* Pentland Hills; *Mr. Maughan.* Humby Wood. *Dr. Greville.* Langton Wood! *Sir W. C. Trevelyan.* Glen Dole; Craigs of Lundie; Hill of Turin; Reeky Linn. *Mr. W. Gardiner.* Rock of St. Skæ near Usan. *Mr. A. Croall.* Arran. *Prof. Balfour.* Finlarig near Killin. *Dr. Holl.* Western Grampians. *Rev. J. M. Crombie.*

IRELAND:—Woods near Killarney, common. *Dr. Taylor.*

WALES:—Baron Hill near Beaumaris. *Rev. A. Bloxam.* Torrent Walk near Dolgelley!

CHANNEL ISLANDS:—Guernsey. *Rev. T. Salwey.* La Coupe, Boulay Bay, Jersey. *Mr. Larbalestier.*

### B. *Cyphellate.*

4. *S. damæcornis*, Ach. var. *macrophylla*, (Hook.) pale fusco-rufescent, smooth, laciniate, lobes broadly dilated, sinuate, retuso-truncate, under surface dark brown tomentose; apothecia marginal or scattered, margin entire or obsoletely crenulate; spores colourless, fusiform, 1-3-septate.

On shady rocks, very rare.

SYN:—Hook. Br. Fl. 2. 205. (1833). Mudd Man. 89.

FIG:—E. Bot. Suppl. 2697.

EXS:—Hepp 869.

GEOG. DISTRIB:—America, Africa, Polynesia, Australasia.

BOT. PROV:—19.

IRELAND:—Turk Cascade near Killarney! Cromagloun Mountains. *Mr. Wilson.* Killarney. (in fruit)! *Mr. Carroll.* roadside near Kenmare and Killarney. *Dr. Taylor.*

### C. *Pseudo-cyphellate, citrine.*

3. *S. aurata*, Ach. red, lobate, sinuato-incised, crenato-undulate, citrino-pulverulent; under side fusco-nigricant, rufescent towards margins, tomentose; apothecia subpodicellate, margin inflexed; spores fuscous, fusiform, 3-septate.

On trees and rocks, rare.

SYN:—Ach. Meth. 277. (1803). Nyl. Syn. 361.

FIG:—E. Bot. 2359.

EXS:—Welw. Lusit. 1. 125. Spruce Amaz. 91. Schær. 558. Maudon 19. Larbal. 16. Leight. 261.

GEOG. DISTRIB:—W. Europe, Africa, Tropical Asia, Polynesia, Australasia, N. Zealand.

BOT. PROV:—1, 2...31.

ENGLAND:—Devonshire. *Mr. Hudson*. Ryde, Isle of Wight ! *Rev. A. Bloxam*.

CHANNEL ISLANDS:—Sark ! Island of Brichou. *Mr. Larbalestier*. Scilly Islands. *Rev. T. Salwey*. Jerbourg. *Mr. Lukis*. on rocks north of the Eperquerie, Sark. *Rev. T. Salwey*. Jerbourg, Guernsey. *Mrs. Collings*.

### III. RICASOLIA, (*D.N.*)

Thallus lobate or laciniate, affixed by fasciculate rhizinae. Cyphellæ none. Stratum gonimon consists of small yellow-green gonidia. Spermogonia in mastoid prominences.

1. *R. amplissima*, (Scop.) *pallido-glaucescens*, coriaceous, orbicular, laciniato-lobate, sinuato-lobulate, rugulose, glomuliferous, under surface pale brown and tomentose, rhizinae fuscous; apothecia rufous, receptacle granulato-furfuraceous, margin inflexed; spores elongato-fusiform, 1-3-septate. (medulla K—C—).

On trees, not common.

SYN:—Scop. Carn. 2. p. 386. (1772). *glomulifera*, Lightf. Nyl. Syn. 368.

FIG:—E. Bot. 293. Mich. Gen. t. 46. Dill. t. 26. f. 99.

EXS:—Hepp 594. Leight. 110. Schær. 559. M. & N. 346. Anzi Langob. 372. Mass. 105. Larbal. 62.

GEOG. DISTRIB:—Europe, Algeria, N. America, Asia.

BOT. PROV:—1...5, 6, 7...11, 12...14, 15, 16...19...30, 31.

ENGLAND:—Llanforda near Oswestry, Shropshire ! *Rev. T. Salwey*. Sedbergh, Westmoreland. *Mr. Slinger*. near Middleton, Teesdale. *Mr. W. Brunton*. near Launceston. *Messrs Turner & Saverby*. Hishope and Horsleyhope Denes, Durham; East Common Wood near Hexham, Northumberland. *Mr. Winch*. Romaldkirk. *Rev. J. Harriman*. between Lustleigh Cleve and Moriton, Devon. *Mr. Parfitt*.

SCOTLAND:—Moberieff Hill, Perth. *Dr. Lindsay*. near Aberfeldy, Perthshire. *Mr. H. Macmillan*. near Inverary. *Messrs Turner & Hooker*. Pentland Hills. *Mr. Maughan*. Humby Woods. *Dr. Greville*. Lundie Craigs. *Mr. W. Gardiner*. Clova. *Mr. G. Don*. near Killin. *Dr. Holl*. Barcaldine, Appin. *Rev. J. M. Creebie*.

IRELAND:—Co. Antrim. *Dr. Moore*. Dinis Island, Killarney. *Mr. Carroll*.

WALES :—Hafod, Cardiganshire. *Sir J. E. Smith*. Corsygedol near Barmouth. *Rev. T. Salwey*.

CHANNEL ISLANDS :—Jerbourg, Guernsey. *Rev. T. Salwey*. Cliffs between Rozel and Boulay Bay, Jersey ; Sark ! *Mr. Larbalestier*.

2. *R. latevirens*, (Lightf.) *pale brown, membranaceous, rugulose, crowdedly lobate, rotundato-crenate and undulate*, under surface pale and tomentose, *rhizinae pale* ; apothecia *rufous*, receptacle *granulato-rugulose*, inflexed ; spores colourless or pallido-fuscescent, fusiform, 1-3-septate. (medulla K—C—).

On trees and rocks, not common.

SYN :—Lightf. Scot. p. 852. *herbacea*, Huds. Nyl. Syn. 369.

FIG :—E. Bot. 294. Hfm. Pl. L. t. 10. f. 2. Nyl. Syn. t. 1. f. 6. & t. 8. f. 46.

EXS :—Hepp 593. Leight. 75. Schær, 560. Welw. Lusit. 4. Maud. 28. Fries. 334.

GEOG. DISTRIB :—Europe, Africa, N. America.

BOT. PROV :—1, 2, 5...7, 8...10...12...14, 15...19...22...30, 31.

ENGLAND :—Derbyshire and Westmoreland. *Sir J. E. Smith*. Baysdale, Cleveland ; *Mr. Mudd*. Charnwood Forest, Leicestershire ! *Rev. A. Bloxam*. Helks Wood, Ingleborough. *Dr. Carrington*. Strath Braan Woods, Dunkeld, and near Thirsk. *Mr. J. G. Baker*. Hackfall near Ripon. *Mr. W. Brunton*. Sedbergh, Westmoreland. *Mr. S. Slinger*. Bringewood Hill opposite Downton Castle. *Rev. T. Salwey*. Horsleyhope and Hishope Denes ; Shipley Wood near Eglestone, Durham. *Mr. Winch*. Irehope Dene, Weardale, Durham. *Sir W. C. Trevelyan*. Healey Field, Durham. *Mr. Waugh*. Shanklin, Isle of Wight ; and S. Devon and Cornwall, generally. *Dr. Holl*. Budleigh Salterton. *Dr. Dickie*.

SCOTLAND :—Drumlanrig Wood. *Mr. W. Stevens*. Auchindenny Woods. *Dr. Greville*. Auldbar. *Mr. W. Gardiner*. near Kinnaird. *Mr. A. Croall*. Clova. *Mr. G. Don*.

IRELAND :—Killarney. *Dr. Carrington*. near Cork. *Mr. Carroll*. Glenaim, Antrim, and Powerscourt, Wicklow. *Dr. Moore*.

WALES :—Near Oswestry, but in Denbighshire ! and Barmouth ! Corsygedol. *Rev. T. Salwey*. near Beaumaris. *Rev. A. Bloxam*.

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey*. Boulay Bay, Jersey. *Mr. Larbalestier*.

## SUB-TRIBE II. IMBRICARIEI.

Thallus laciniate or laciniato-lobate. Apothecia with ellipsoid, rarely oblong, simple, colourless spores. Paraphyses indistinct. Spermogonia innate. Spermatia acicular, fusiformi-incrassulate at either apex, or long cylindrical and arcuate. (Nyl. Syn. t. 8. f. 48.)



IV. PARMELIA, *Ach. Nyl.*

Thallus variously lobato-divided or laciniate, expanded, somewhat shining, medulla stuppeous. Apothecia scattered. Spores 8, ellipsoid, simple, small. Sterigmata 2-5-articulated. Spermatia acicular, fusiform-in-crassulate at the acute apices. (Nyl. Syn. t. 8. f. 47. e.)

*A. medulla of thallus K—C—.*

1. *P. caperata*, (L.) *flavescent* or *substramineous*, dilated, lobato-incised, *rugose*, under surface black, paler at the margin, nigro-rhizinose; apothecia badio-rufescent, margin crenulate pulverulent; spores 8, colourless, ellipsoid, simple; thallus K *f* + C + medulla K—C—.

On rocks and trees common. 1696.

SYN:—Linn. Sp. Pl. ed. 1. No. 41. (1753). Nyl. Syn. 376.

FIG:—E. Bot 654. Hfm. Pl. L. t. 39. f. 1.

EXS:—M. & N. 255. Schaer. 377. Tuck. 75. Nyl. 31. Anzi It. S. 107. Hepp 854. Mudd 73. Mass. 20. Welw. Lusit. 80. Leight. 77. Bohl. 123.

GEOG. DISTRIB:—Europe, Africa, Asia, America, Australasia.

BOT. PROV:—1, 2, 3, 4, 5...10, 11, 12...14...19...31.

ENGLAND:—Near Penzance and Camelford, Cornwall. *Messrs Sowerby & Turner*. Lounsedale and Kildale! Cleveland. *Mr. Mudd*. New Forest. *Rev J. M. Crombie*. Ryde, Isle of Wight! *Rev. A. Blower*. Cambridge. *Rev. R. Relhan*. Oxford. *Dr. Sibthorp*. Keswick, Cumberland. *Mrs. Stanger*. near Lewes, Sussex. *Mr. W. Unwin*. near Sedbergh, Kendal. *Mr. S. Slinger*. Wensleydale, *Mr. J. W. Watson*. Heddon-on-the-wall and West Dipton near Hexham, Northumberland. *Mr. Winch*. Romaldkirk. *Rev. J. Harriman*. near Totness; Bradley Wood, Newton Bushell. *Dr. Holl*. Ashburton, Devon. *Dr. Ralsjs*. Lustleigh Cleve, Devon. *Mr. Parfitt*. Kelvedon, Essex. *Mr. Varnne*. Midland Counties. *Mr. Purton*. Bedfordshire. *Rev. C. Abbot*. Haughmond Hill! Nesscliffe Hill! Shropshire.

SCOTLAND:—Pentland Hills, *Rev. J. M. Crombie*.

IRELAND:—Castlebernard Park, Bandon! *Mr. E. Fisher*. Dunkerron Mountains; Tralee. *Dr. Taylor*. near Cork. *Mr. Carroll*.

CHANNEL ISLANDS:—Jersey, Sark, Herm, Jethou! *Mr. Larbalestier*. Guernsey. *Rev. T. Salwey*.

2. *P. olivacea*, (L.) olivaceo-fuscous, orbicular or sub-orbicular, *minutely corrugate*, *laciniato-lobate*, lobes *appressed*, plane, *crenate*, *sub-opake*, under surface concolorous; medulla white K—C—; apothecia badius

or badio-rufescent, margin entire ; spores 8, colourless, elliptical, simple.

On trees, palings, &c. 1690.

SYN :—Linn. Sp. Pl. ed. 1. (1753). Ach. Syn. 200. Nyl. Syn. 395.

FIG :—E. Bot. 2180.

EXS :—Bohl. 86. Schær. 370. 371. Fellm. 81. Anzi Ven. 20 Mass. 167.

GEOG. DISTRIB :—Europe, Africa, America, Asia, Australasia.

BOT. PROV :—1...3, 4, 5...11...14, 15...(19—30)...31.

ENGLAND :—Berwick-on-Tweed ! *Dr. G. Johnston*. Northumberland and Durham. *Mr. Winch*. Kelvedon, Essex. *Mr. Varenne*. Devonshire. *Mr. Parfitt*. Cambridge. *Rev. R. Relhan*. Oxford. *Dr. Sibthorp*. Bedford. *Rev. C. Abbot*. near Shrewsbury ! Stiperstones ! Bomere ! Shropshire.

SCOTLAND :—Fort Augustus, Caledonian Canal ! *Dr. Lindsay*. Craigerook, Colinton and Swanston Woods. *Mr. Maughan*. Braid Hermitage. *Dr. Greville*. Reeky Linn ; Airlie ; Camperdown ; Hare Craigs ; Clova. *Mr. W. Gardiner*.

IRELAND :—common. *Dr. Taylor & Mr. J. Carroll*.

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey*. common on all the islands. *Mr. Larbalestier*.

Var. *exasperata*, (Ach.) thallus and receptacle *minutely papillato-exasperate* ; medulla white K—C—.

On trees.

SYN :—Ach. Syn. 320. (1817). Nyl. Syn. 396.

FIG :—Vaill. Paris. t. 20. f. 8.

EXS :—Mass. 13. Mudd 72. Anzi It. S. 115. M. & N. 161. Leight. 263.

GEOG. DISTRIB :—Europe.

BOT. PROV :—5.. 7...10...16.. 19.

ENGLAND :—Ayton. Cleveland ! *Mr. Mudd*. Pembridge, Herefordshire ! *Rev. J. F. Crouch*. near Worcester, *Dr. Holl*. Bomere Pool ! near Shrewsbury !

SCOTLAND :—Loch Awe. *Rev. J. M. Crombie*.

IRELAND :—Glencar, co. Kerry ; Glena ; Base of Mangerton, Killarney. *Mr. J. Carroll*.

WALES :—Dolgelley. *Dr. Holl*.

Var. *prolixa*, Ach. dark olivaceous, sub-orbicular or effuse, *laciniate*, *lacinae* narrow, variously divided, *multifid*, plane, *crenato-incised*, under surface nigricant, fibrillose ; medulla white K—C—.

On rocks.

SYN :—Ach. Meth. 214. (1803). Nyl. Syn. 404.

EXS :—Anzi It. S. 116. Schær. 372. Leight. 291.

GEOG. DISTRIB :—Europe, Algeria, Asia, Australasia.

BOT. PROV :—1.. 7...15...19...23.

ENGLAND :—Torquay, Ilsham ! *Dr. Deakin*. Whitesand Bay, Cornwall ; Wembury, S. Devon. *Dr. Holl*.

SCOTLAND :—Kincardine. *Rev. J. M. Crombie*.

IRELAND :—Howth. *Dr. Moore*. Mizen Head. *Mr. J. Wright*. Kilkee. *Mr. J. Carroll*. south of Ireland. *Miss Hutchins*.

WALES :—Barmouth !.

3. *P. stygia*, (L.) castaneo-fuscous or pitch-black, somewhat shining, orbicular, firm, laciniae *sublinear*, *multifid*, plane or convex, imbricate, divided, under-surface black or spadiceous towards the margins, rhizinae few, medulla white K—C— ; apothecia fuscous, *margin granulato-crenate* ; spores 8, colourless, elliptical, simple.

On alpine rocks. 1793.

SYN :—Linn. Sp. Pl. ed. 1. No. 23. (1753). Ach. Syn. 204. Nyl. Syn. 397.

FIG :—E. Bot. 2648. Hfm. En. t. 14. f. 2.

EXS :—Hepp 587. Fr. 166, 337. Anzi It. S. 111. Tuck. 17. Dicks. 25. M. & N. 351. Schær. 225.

GEOG. DISTRIB :—Europe, N. America.

BOT. PROV :—7...11...15...26.

ENGLAND :—Butsfield Moors, Durham. *Mr. Winch*.

SCOTLAND :—Highlands of Scotland ! *Mr. Dickson*. (1793). Ben Nevis (4406 ft.) ! Ben Mac Dhui, Braemar. (4296 ft.) ! *Dr. Lindsay*. Caintochan, Clova ; *Mr. R. Jacob*. Ben More, Breadalbane ; Lochnagar, Braemar. *Rev. J. M. Crombie*.

IRELAND :—(f. minor,) Mayo. *Dr. Moore*.

WALES :—Llandegley Rocks. *Rev. T. Salwey*.

4. *P. lanata*, (L.) nigricant or fusco-nigricant, *fili-form*, *alectorioid*, *terete*, *slender*, decumbent, *ramose*, *entangled*, shining ; apothecia lateral, concolorous, margin sub-entire or *granulato-unequal* ; spores 8, colourless, elliptical, simple ; medulla white K—C—.

On alpine rocks. 1724.

SYN :—Linn. Sp. Pl. ed. 1. No. 74. (1753). Ach. Syn. 302. Nyl. Syn. 398.

FIG :—E. Bot. 846.

EXS :—Fellm. 82. Hepp 588. Anzi Langob. 53. M. & N. 557. Schær. 257.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1...5.. 7...11, 12...15.. 19...23.

ENGLAND :—Northern Counties. *Sir J. E. Smith*. Helvellyn ! *Mrs. Stanger*. Teesdale Moors, Durham ; Cheviot, Simonside and Hedgehope, Northumberland. *Mr. Winch*. Ragley Park, Warwickshire. *Mr. Purton*. Cornwall. *Mr. Stephens*. (1724).

SCOTLAND :—High Mountains. *Sir J. E. Smith*. Ben More ; Ben-naboord ; Massuna, Braemar ! Ben Lawers ! *Rev. J. M. Crombie*.

Ben Macdhui; Lochnagar! *Dr. Lindsay*. Ben Nevis. *Adm. Jones*. near Aberfeldy, Perthshire. *Mr. H. Macmillan*.

IRELAND:—Mangerton, co. Kerry. *Mr. J. Carroll*. near Belfast. *Mr. Templeton*. on the mountains in the South. *Dr. Taylor*. Mc Gillicuddy's Reeks. *Dr. Moore*.

WALES:—Borth and Snowdon. *Dillenius*. Bangor. *Mr. Brewer*.

A var. *subciliata*, Nyl. (Flora 1868. p. 346.) has been rarely found on calcareous rocks at Morrone in Braemar by *Rev. J. M. Crombie*, "differt a typo receptaculo papillis spinuliformibus vel corniculis phallinis ciliato."

5. *P. physodes*, (L.) whitish, substellate, laciniae multifid, plane, glabrous, smooth, imbricate, under surface naked, rugose, fuscous-black, apices inflated and badiopalescent K yellow C yellow, medulla white K—C—; apothecia spadiceous or badio-rufescent, margin entire; spores 8, colourless, oblong, simple, small.

On trees, rocks, &c. common. 1724.

SYN:—Linn. Sp. Pl. ed. 1. No. 26. (1753.) Ach. Syn. 218. Nyl. Syn. 400.

FIG:—E. Bot. 126.

EXS:—Fellm. 75. Hepp 534. Anzi Langob. (right hand spec.) 257. A. Fr. 291. Leight. (left hand spec.) 48.

GEOG. DISTRIB:—Throughout the world.

BOT. PROV:—1...3, 4, 5...7, 8...10, 11...14, 15, 16...19, 20...30, 31.

ENGLAND:—Cromford Moor near Matlock. *Sir J. E. Smith*. Lamberton Moor! Blachadder plantations! Berwick-on-Tweed. *Dr. G. Johnston*. Cambridge. *Rev. R. Kelhan*. Moor Park, Herefordshire. *Rev. T. Salwey*. Castle Howard, Yorkshire. *Mr. Teesdale*. Gateshead Fell, Durham. *Mr. Winch*. Lustleigh Cleve, Devon. *Mr. Parfitt*. Colne; Braxter; Kelvedon, Essex. *Mr. Varenne*. Midland Counties. *Mr. Purton*. Bedfordshire. *Rev. C. Abbot*. Wrekin Hill, Shropshire!

SCOTLAND:—Loch-na-Gat Glen, Ben Lawers (in fruit)! *Mr. McKinlay*. Garrynahine, Lewis; Knock Hill Crieff! fr. *Dr. Lindsay*. near Dumfries (in fruit). *Dr. Richardson*. Pentland Hills. *Mr. Maughan*. Cathkin Hills. *Mr. Hopkirk*. Swanston Woods (fruit). *Dr. Greville*. Baldovan and Deerhill Woods; Camperdown; Auchterhouse; Auldbar. *Mr. W. Gardiner*. near Kinnaird. *Mr. A. Bousie*. Arran. *Prof. Balfour*. near Carnbo, at foot of the Ochils, Kinrossshire, (fruit). *Dr. Nichol*.

IRELAND:—Near Belfast (fruit). *Mr. Templeton*. Powerscourt Water Fall. *Mr. G. S. Gough*. Glenbower, Killeagh. *Mr. J. Carroll*. WALES:—Cwmbychan (fruit). *Rev. T. Salwey*. near Llyn Aran, Cader Idris. *Dr. Holl*.

CHANNEL ISLANDS:—Guernsey. *Rev. T. Salwey*. Jersey and Sark. *Mr. Larbalestier*.

Var. *vittata*, Ach. *laciniae* of thallus narrow and linear, *denigrate at the margins*.

On trees, not common.

SYN:—Ach. Meth. 251. (1803.) Syn. 218. Nyl. Scand. 103.

EXS:—Fellm. 76. Schær. 367.

GEOG. DISTRIB:—Switzerland, Italy, Scandinavia.

BOT. PROV:—7...15.

SCOTLAND:—Highlands, frequently. *Dr. Holl.*

WALES:—Dolgelley. *Dr. Holl.*

Var. *recurva*, Leight. like the type, but *apices* of *laciniae recurved and albo-sorediate*.

On trees and rocks, common.

FIG:—E. Bot. 126. upper fig. 1. 3.

EXS:—Nyl. 113. Mudd 70.

GEOG. DISTRIB:—Europe.

BOT. PROV:—5...7...10...12...15.

ENGLAND:—Hay Park, Herefordshire (fruit)! *Rev. T. Salwey*. High Cliff! and Loundsdale! Cleveland. *Mr. Mudd*. Keswick, Cumberland (fruit)! *Mrs. Stanger*. Nesscliffe Hill! Wrekin Hill! Long Mynd! Stiperstones! Shropshire.

SCOTLAND:—Loch-na-Gat stream, Ben Lawers (fruit)! *Mr. A. Mc Kinlay*.

N. WALES:—Barmouth!

Var. *labrosa*, Ach. *apices* of *laciniae* sub-cylindrical, *turgescent, tuberculoso-albo-sorediate*.

On trees &c. common.

SYN:—Ach. L. U. 492. (1810.)

FIG:—Hffm. Enum. t. 15. f. 2. E. Bot. 126. fig. 5.

EXS:—Arn. 297. Mass. 278. Bohl. 13. Leight. 48. (right hand spec). Hepp 856. Rabh. 793.

GEOG. DISTRIB:—Europe.

BOT. PROV:—5...(13—18).

ENGLAND:—Malvern Hills, Worcestershire. *Sir J. E. Smith*. Pentre-noon, Monmouth. *Dr. Holl*. Wrekin Hill, Shropshire!

SCOTLAND:—frequent. *Rev. J. M. Crombie*.

Var. *platyphylla*, Ach. *orbicular*, *laciniae* smooth, glabrous, *broad*, *turgid and undulate*, and spermogoniferous towards the centre, *appressed, rounded and crenate* at the circumference.

On rocks, not common.

SYN:—Ach. Meth. 251. (1803.) Syn. 219. Nyl. Syn. 400.

EXS:—Schær. 366. M. & N. 159.

GEOG. DISTRIB:—5...10, 11. 15...20.

BOT. PROV:—Europe.

ENGLAND:—Snailsworth! *Mr. J. G. Baker*. Yorkshire! *Mr.*



*6. Dicon.* Waskeley Bonrn and Wolsingham Park, Durham. *Mr. Winch.*

SCOTLAND :—Blueberry Hill, Perth! *Dr. Lindsay.*

IRELAND :—Near Cork! *Mr. J. Carroll.*

N. WALES :—Pentregaer near Oswestry! *Rev. T. Salwey.*

Var. *encausta*, (Sm.) *albido-cinerascent*, nearly fuscous, *narrowly laciniate*, unequal, *laciniae multifid*, *convex or terete*, imbricato-decumbent or depressed, under surface nigricant, opaque; apothecia badio-rufous, margin crenulate; medulla white K—C—.

On alpine rocks, rare. 1791.

SYN :—Sm. in Trans. Linn. Soc. 1. p. 83. (1791). Ach. Syn. 206. Nyl. Syn. 401.

FIG :—Trans. Linn. Soc. 1. t. 4. f. 6. E. Bot. 2049. Hffm. Pl. L. t. 32. f. 2.

EXS :—Schar. 368. Fr. 338. Anzi It. S. 106. Zw. 183. Hepp 52. M. & N. 353.

GEOG. DISTRIB :—Europe.

BOT. PROV :—15.

SCOTLAND :—Ben Nevis. *Dr. Stuart.* Cairntoul; Ben Lawers; Ben More; Morrone. *Rev. J. M. Crombie.*

Var. *discreta*, Nyl. *nigro-olivaceous*, *crustaceo-cartilaginous*, orbicular or expanded, sub-opaque, *laciniae convex*, *rugoso-plicate*, imbricate and complicate, *narrow*, *toruloso-intricate*, apices incurved, under surface very black, sparsely fibrillose, medulla white K—C—; apothecia nigricant, concave, margin entire; spores 8, colourless, ellipsoid or sub-globose, simple.

On alpine rocks.

SYN :—*Parmelia alpicola*, Th. Fr. Lich. Arctoi 57. (1860.) *Parmelia encausta*, var. *stygioides*, Linds. Tr. Roy. Soc. Edin. 22. p. 224. *Mougeotii* f. *discreta*, Nyl. Syn. 400.

GEOG. DISTRIB :—Scandinavia.

BOT. PROV :—15.

SCOTLAND :—Cairngorm, Braemar. *Dr. Lindsay.* (1856). Morrone Ben-na-board; Ben More; Breadalbane. *Rev. J. M. Crombie.*

6. *P. ambigua*, (Wulf.) *stramineous*, *stellato-orbicular*, appressed, *laciniae* narrow, applanate, multifid, *flavosorediate*, under surface fuscous-black; apothecia rufobadious or badio-fuscous, margin sub-entire; spores 8, colourless, oblong or ovoideo-oblong, curved, simple; thallus K—C+, medulla white K—C—.

On fir trees, posts, &c. 1808.

SYN:—Wulf in Jacq. Coll. 4. 239. (1790). Ach. Syn. 208. Nyl. Lich. Scand. 105.

FIG:—E. B. Suppl. 2796. Hfin. Pl. L. t. 40. f. 2. 3. 4. t. 42. f. 2. 3.

EXS:—Anzi Langob. 52. Fellm. 85. Hepp 858. Schaer. 375. M. & N. 449. Mudd 75. Leight. 373.

GEOG. DISTRIB:—Europe, N. America.

BOT. PROV:—5...7, 8, 9, 10..15.

ENGLAND:—Gopsall Park, Leicestershire! *Rev. A. Bloxam*. Pentregaer near Oswestry! Hay Park near Ludlow. *Rev. T. Salwey*. Ingleby Greenhow! Hoggarts Wood, Cleveland. *Mr. Mudd*. Clougha. Lancashire. *Mr. R. Jacob*.

SCOTLAND:—Larig Crue under Cairngorm; Forest of Rothiemurchus. *Mr. Borrer*. (1808). Marr Forest; *Mr. G. Don*. Northern Forest of the Highlands; Kinnordy, Forfarshire. *Sir. W. J. Hooker*. Cairngorm; *Messrs Borrer & Hooker*. Glen Derry. *Rev. J. M. Crombie*.

WALES:—Cwmbychan near Barmouth, and Powis Castle Park. *Rev. T. Salwey*.

7. *P. cetrarioides*, Del. *glauco-albescent*, subcoriaceous, orbicular, lobes rotundate, margin rotundo-crenate, elevated, crisped; medulla K—; apothecia badio-rufous, margin entire; spores 8, colourless, ellipsoid, simple.

On trees and stones, frequent. 1869.

SYN:—*P. perlata* var. *cetrarioides*, Delise in Duby Bot. Gall. 601. (1829). Nyl. in Flora 1869. p. 290. Crombie En. 34.

EXS:—Fr. 335. Hepp 578.

GEOG DISTRIB:—Europe.

BOT PROV:—2...7.

ENGLAND:—New Forest. *Rev. J. M. Crombie*.

WALES:—Dolgelley! Barmouth! *Dr. Holl*. (1869).

### *B. medulla of thallus K yellow.*

8. *P. perlata*, (L.) *albo-glaucouscent or whitish*, dilated, lobate, lobes rotundate, subimbricate, often albo-sorediate on the margins, under surface fuscous-black or black, and pale towards margins; K + C +, medulla K yellow; apothecia badio-rufous, margin entire; spores 8, colourless, ellipsoid, simple.

On trees (rare in fruit.) 1741.

SYN:—Linn. Syst. Nat. ed. 12. p. 712. (1767). Ach. Syn. 197. Nyl. Syn. 397.

FIG:—E. Bot. 341.

EXS:—Hepp 579. 580. Zw. 185. Fr. 335. M. & N. 253. Leight. 76. Anzi Langob. 48.

BOT. PROV:—1, 2, 3...5, 6, 7...10...13...15.. 19, 20...26...31.

ENGLAND:—Penzance, Cornwall; Stoke Wood, Devonshire; *Mr. E. Parfitt*, near Lewes, Sussex. *Mr. W. Unwin*, near Ilfracombe. *Miss M. Atwood*, Helks Wood, Ingleborough. *Dr. Carrington*, Boudsdale Gill, Cleveland. *Mr. Mudd*, between Camelford and Bodmin; near Ilfracombe. *Messrs Turner & Sowerby*, Kelvedon; Inworth; Easthorpe, Essex. *Mr. Varenne*, Stoke Wood, Exeter. *Mr. Parfitt*, Midland Counties. *Mr. Purton*, Oxford. *Dillenius* (1741). Cambridge. *Rev. R. Relhan*, Haughmond Hill! Shropshire.

SCOTLAND:—Kinnoul Hill, Perth; Caerlaverock Road, Dumfries; Quiraing, Skye. *Dr. Lindsay*, S.W. of Scotland. *Rev. J. M. Crombie*.

IRELAND:—Fermoy! *Mr. T. Chandler*, near Cork! and near Knockmore, near Carregaline, Cork. *Mr. J. Carroll*, near Dunkerron. *Dr. Taylor*, near Lough Corrib, Galway. *Dr. Moore*.

WALES:—Hafod, Cardiganshire. *Sir J. E. Smith*, Barmouth (in fruit)! *Rev. T. Salwey*.

CHANNEL ISLANDS:—Common on all the Islands. *Mr. Larbalestier*.

Var. *ciliata*, DC. thallus nearly naked beneath, and *nigro-ciliate* at the margins, (medulla K yellow.)

On trees and rocks. 1812.

SYN:—DC. Fl. Fr. 2. p. 403, (1805.) Nyl. Syn. 380.

FIG:—E. Bot. 2423.

EXS:—Welw. Lusit. 75. 77. 81. Zw. 56. Anz. It. S. 100. 101. Arn. 136. Lerb. 17.

BOT. PROV:—1, 2 ..7...16...19...31.

ENGLAND:—Sussex. *Mr. Borrer*, Bolt Head and Dartmoor, S. Devon. *Dr. Holl*.

SCOTLAND:—Crinan Canal, Argyleshire! *Dr. Lindsay*.

IRELAND:—Castlebernard Park, Bandon! *Mr. J. Carroll*, Dunkerron. *Dr. Taylor*.

WALES:—Barmouth! *Rev. T. Salwey*, Dolgelley. *Dr. Holl*.

CHANNEL ISLANDS:—E. coast of Jersey! and Guernsey. *Mr. Larbalestier*.

9. *P. pertusa*, (Schrank) whitish, orbicular, plano-appressed, glabrous, laciniae narrow, multifid, sinuate, convex, somewhat shining, minutely perforated, apices dilated, crenato-incised, sometimes sorediate, under surface black and rugose; apothecia rufo-fuscescent, margin entire, inflexed; spores colourless, 2—4, broadly elliptical, simple, large. (medulla white K yellow).

On rocks and trees, rare in fruit. 1800.

SYN:—Schrank. Bayer Fl. 2. No. 1513. (1789.) Ach. Syn. 219. Nyl. Syn. 402.

FIG:—E. Bot. 1248. Hepp Sporen t. 97. f. 857.

EXS:—Zw. 252. Leight. 264. Hepp 857 Anz. 105. Tuck. 16. Schær. 365. Nyl. 32. M. & N. 65. Lerb. 66.

GEOG. DISTRIB :—Europe, Asia, America, Australasia.

BOT. PROV :—1...7...16.. 19...30 ..31.

ENGLAND :—Lynton, Devon. *Rev. J. M. Crombie*.

SCOTLAND :—Ballacheulish in Appin (fruit). *Messrs Turner & Hooker*.

IRELAND :—Dunkerron Mountains. *Dr. Taylor*. Pass of Keirna-Eigh, co. Cork ; Glenmore Lake, Kerry ; Eagle's Nest, Killarney. *Mr. J. Carroll*. Cushendun, co. Antrim. *Dr. Moore*.

WALES :—Beddgelert. *Mr. D. Turner*. (1800). Cwmbychan ; rocks above Hendremynach ; and on alder trees at Nannau. *Rev. T. Salwey*. Garth near Dolgelly. *Dr. Holl*. Barmouth !

CHANNEL ISLANDS :—Bonne Nuit, Jersey ! *Mr. Larbalestier*.

10. *P. aleurites*, Ach. *whitish or albido-cinerascent*, stellato-orbicular, appressed, laciniae narrow, applanate, multifid, *albo-sorediate* ; apothecia spadiceo-fuscous or rufescent, margin crenulate, sorediate ; spores 8, colourless, oblong or oblongo-ovoid, simple ; thallus K + C—medulla K yellow.

On posts, palings, &c. not uncommon. 1793.

SYN :—Ach. Prodr. 117. (1798). Syn. 208. Nyl. Scand. 105.

FIG :—E. Bot. 858. Dicks. Cr. Br. t. 9. f. 6. Hfm. Pl. t. 65. f. 2. Hepp. Sporen t. 98. 859.

EXS :—Zw. 54. Schaer. 489. 376. M. & N. 739. Mudd 71. Hepp 859. Anzi Langob. 50. Fellm. 95.

BOT. PROV :—3, 4, 5...8...10...15.

ENGLAND :—Croft Castle Park, Herefordshire. *Mr. Dickson*. (1793). Henham, Suffolk. *Mr. D. Turner*. near Windsor. *Dr. G. H. Noehden*. Oswestry ! Hay Park near Ludlow ; Oteley Park near Ellesmere. *Rev. T. Salwey*. Rosedale ; Farndale ; Bransdale ; Baysdale ! Kildale ; Ingley Park, Yorkshire. *Mr. Mudd*. Gopsall, Leicestershire. *Rev. A. Bloxam*.

SCOTLAND :—Scotch Highlands. *Rev. J. Dalton*. Glen Dee, Braemar. *Rev. J. M. Crombie*.

### *C. medulla of thallus C red.*

11. *P. olivetorum*, (Ach.) externally similar to the sorediate states of *P. perlata*, but distinguished by chemical reaction of the white medulla, which is tinged red by C. (but more definitely red by applying C first then K and then C again.)

On rocks, rare.

SYN :—Ach. Meth. 217. (1803.) Syn. 198. Nyl. Lapp. Or. 180.

FIG :—Dill. t. 20. f. 39. B.

EXS :—Tuck. 15. Anzi It. S. 99.

GEOG. DISTRIB :—Europe, N. America.

BOT. PROV :—2,

ENGLAND:—Danny, Sussex, in herb. Hooker, determined by Dr. Nylander.

12. *P. tiliacea*, (Ach.) glaucescent, *sub-orbicular*, *laciniato-lobate*, *laciniae rotundate*, smooth, margins *sinato-crenate*; apothecia *badio-rufescent*, chiefly in the centre of the thallus, receptacle smooth, margin nearly entire; spores 8, colourless, oblong, simple; medulla white C red.

On trees &c. 1791.

SYN:—Ach. Meth. 215. Nyl. Syn. 382.

FIG:—E. Bot. 700. Hepp Sporen t. 97. f. 855.

EXS:—Mass. 326. 327. Mudd 68. Anzi It. S. 102. Langob. 26. Hepp 855. c. Larb. 18. Hampe 43.

GEOG. DISTRIB:—Europe, Asia, Africa, N. America, Australasia.

BOT. PROV:—1, 2 ..7...31.

ENGLAND:—Dunster, Somersetshire. *Messrs Turner & Sowerby*. Lynton, N. Devon! *Mr. Mudd*. near Torquay! *Dr. Deakin*. New Forest! St. Leonard's Forest! *Mr. Borrer*. near Cornworthy, S. Devon! Dartmoor! *Dr. Holl*. Budleigh Salterton! *Mr. Carter*.

WALES:—Anglesea and Carnarvonshire. *Rev. Hugh Davies*. Aber-gwynant near Dolgelley! *Dr. Holl*.

CHANNEL ISLANDS:—L'Etacq, Jersey! *Mr. Larbalestier*. Guernsey. *Rev. T. Salwey*.

Var. *rugosula*, Leight. orbicular, *centre of thallus and base of rotundate laciniae singularly transversely wrinkled*; medulla white C red.

On trees.

EXS:—Schær. 358. Zw. 53.

GEOG. DISTRIB:—Europe.

BOT. PROV:—2, 3...19.

ENGLAND:—Near Esher Bridge! *Mr. Borrer*. Chart Park, Dorking! *Mr. Jenner*.

IRELAND:—Banks of Blackwater river, co. Kerry. *Dr. Taylor*.

Var. *scorteæ*, (Ach.) orbicular, *sinuato-lobate*, *lobes short, rotund, undulate*, margin *inciso-crenate*, *centre of the thallus isidiiferous and pulverulent*; medulla white C red.

On trees, palings, &c. 1809.

SYN:—Ach. Prodr. 119. Nyl. Syn. 383.

FIG:—E. Bot. 2065.

EXS:—Anzi It. S. 103. Hepp 855. b. and 581. M. & N. 445. Mass. 328. Leight. 87. Schær. 359.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1, 2...5, 7.. 11...13...19...20...31.

ENGLAND:—Henfield! Sussex; Portnalls and on Farthing Down!



Stonehenge! Livermere! *Rev. G. R. Leathes*. (1809). Little Stretton, Shropshire! *Rev. T. Salwey*. Staveley, Kendal! *Mr. J. A. Martindale*. Twycross, Leicestershire! *Rev. A. Bloxam*. Bolt Head, S. Devon! *Dr. Holl*. Foggerforth near Egglestone, Durham! *Rev. J. Harriman*. Haldon, Devon. *Mr. Parfitt*. Church Stretton, co. Salop.

SCOTLAND:—Caerlaverack, Dumfries! *Dr. Lindsay*.

IRELAND:—Ballymartle, co. Cork! *Mr. J. Carroll*. Askew Wood, co. Kerry! *Dr. Taylor*.

WALES:—Holyhead! and Barmouth *Rev. T. Salwey*. near Dolgelley. *Dr. Holl*.

CHANNEL ISLANDS:—L'Etacq, Jersey! Guernsey. *Mr. Larbalestier*.

Var. *revoluta*, (Flk.) sinuato-lobate, lobes cucullato-revolute and tuberculoso-sorediate at the apices; medulla white C red.

On trees.

SYN:—Flk. Deut. Lich. 15. (1815). Nyl. Syn. 385. (excl. syn).

EXS:—Zw. 181. Anzi Langob. 49. Arn. 221. Schær. 612. Mass. 325. Leight. 357.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1, 2...5...7...19...31.

ENGLAND:—Penzance! *Rev. H. Penneck*. St. Leonard's Forest! *Mr. Borrer*. Oswestry! and Ludlow, Shropshire! *Rev. T. Salwey*.

IRELAND:—Blackwater Bridge, Kerry. *Dr. Taylor*. Kerry. *Dr. Moore*.

N. WALES:—Tygwyn near Dolgelley! *Rev. T. Salwey*. Aberdovey! *Rev. A. Bloxam*.

CHANNEL ISLANDS:—La Coupe; Gorey, Jersey! *Mr. Larbalestier*.

Var. *sublaevigata*, Nyl. *pinnatifido-divaricate*, laciniae appressed, linear; narrow, distinct, sinuato-incised, apices truncato-furcate, very atro-rhizinoe beneath; medulla white, C red.

On trees &c.

SYN:—Nyl. Syn. 383. (1860).

EXS:—Lindig 110. Spruce Amaz. 156. Arn. 137. Anzi Langob. 256. Leight. 202.

GEOG. DISTRIB:—Europe, Central America.

BOT. PROV:—1, 2...19.

ENGLAND:—Bournemouth! *Rev. A. Bloxam*. near Exeter! *Prof. Dickie*.

IRELAND:—Dunkerron! *Dr. Taylor*.

Var. *concentrica*, Leight. *sphaerico-conglomerate*, growing in involved concentric layers; medulla white C red.

On exposed downs, rare.

SYN:—Leight. Exs. 232.

FIG :—Gard. Chron. 1856. p. 84. & 172.

EXS :—Leight. 232.

GEOG. DISTRIB :—Europe.

ENGLAND :—Melbury Hill near Shaftesbury, Dorsetshire! *Sir W. C. Trevelyan*.

Dr. Holl in litt. says, "from Bolt Head I have a variety which approaches your *concretrica* but is isidiiferous."

Var. *rugosa*, Tayl. *white*, very uneven, lobes broadly linear, imbricated, margins sinuato-crenate, *rugose at the base on upper surface*, sometimes sorediate, *margin of apothecia rugose*; medulla white C red.

On rocks, rare. 1836.

SYN :—Tayl. in Mack. Fl. Hib. 2. 145. (1836,)

GEOG. DISTRIB :—Europe.

BOT. PROV :—7...15...19...31.

SCOTLAND :—Ballacheulish! *Mr. Borrer*.

IRELAND :—Dunkerron! *Dr. Taylor*.

WALES :—Dolbadarn, Caernarvonshire! road-side between Tyn-y-Croes and Dol-y-mellyn Bridge, Merionethshire! *Mr. Borrer*. Ty Gwyn near Dolgelley! *Rev. T. Salwey*.

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey*.

In external aspect much like *P. lævigata*.

13. *P. Borreri*, (Turn.) cinereo-glaucous, becoming *pale brown when dry, appressed*, imbricate, rugulose, *albo-sorediate*, lobes *broad and rotundate*, under surface fuscous or pallescent; apothecia *badio-rufous*, margin elevated, inflexed; spores 8, colourless, elliptical, simple; medulla white C red.

On trees and rocks. 1807.

SYN :—Turn. in Linn. Trans. 9. 148. (1808.) Ach. Syn. 197. Nyl. Syn. 389.

FIG :—E. Bot. 1780. Linn. Tr. 9. t. 13. f. 2.

EXS :—Hepp 582. 583. 866. 867. Schaer. 361. Leight. 231. Labb. 20. Anzi Langob. 374. Zw. 251. M. & N. 634. Mass. 107. 166.

GEOG. DISTRIB :—Europe, Africa, Asia, America.

BOT. PROV :—1, 2, 3, 4, 5, 6, 7, 8.. 19, 20...22 ..31.

ENGLAND :—Sussex. *Mr. Borrer*. (1807.) Norwich and Coltishall. *Mr. D. Turner*. Twycross, Leicestershire! and near Braunston! *Rev. A. Bloor*. Penzance!; Woodhill and Porkington near Oswestry! *Rev. T. Salwey*. Stanstead Park, Essex. *Mr. R. Jacob*. near Worcester; near Brighton; Isle of Wight. *Dr. Holl*. Bonere Pool! Meole Brook! Stiperstones! Haughton Hill! near Shrewsbury!

IRELAND :—Ballymartle, co. Cork! and Glanure, Cork. *Mr. Carroll*. near Wicklow. *Dr. Mainyay*. Dunkerron; Roughy, co. Kerry. *Dr. Taylor*.

WALES:—Pembrokeshire! Lane between Glanmawddach and Bodowen near Barmouth. *Rev. T. Salwey.*

CHANNEL ISLANDS:—Rozel, Jersey! *Mr. C. Larbalestier.* Guernsey. *Rev. T. Salwey.*

14. *P. fuliginosa*, (Dub.) badio-umbrine, orbicular, laciniato-lobate, lobes appressed, plane, crenate, fuliginoso-furfuraceous or isidiose; apothecia brown, margin thick crenulate; medulla C red.

On rocks, frequent.

SYN:—Dub. Bot. Gall. 602. (1829.) Nyl. Syn. 397.

GEOG. DISTRIB:—Europe.

BOT. PROV:—5...7...12...15...20.

ENGLAND:—Burnside Lane near Staveley in Kendal, Westmoreland! *Mr. J. A. Martinale*, Long Mynd! Stiperstones! Pontesford Hill! Haughmond Hill! Lyth Hill! Shropshire.

SCOTLAND:—Birnam Hill, Dunkeld! *Dr. Lindsay.* Park near Aberdeen; Kincardineshire Coast. *Rev. J. M. Crombie.*

IRELAND:—Near Cork! *Mr. Carroll.*

WALES:—between Corwen and Bala!

*D. medulla of thallus K yellow then red.*

15. *P. perforata*, Wulf. whitish or glaucous-white, lobate or lobato-sinuate or sinuato-divided, smooth, minutely reticulato-rimulose, margin often albo-sorediate, under surface fuscous-black or black; apothecia badio-rufescent or fusco-rufous, often medio-perforate, margin entire; spores 8, colourless, elliptical, simple; medulla white K yellow then red.

On rocks and trees. 1836.

SYN:—Wulf. in Jacq. Coll. 1. 116. (1786). Ach. Syn. 198. Nyl. Syn. 377. *P. reticulata*, Tayl. in Mack. Fl. Hib. 148.

FIG:—Jacq. Coll. 1. t. 3.

ENS:—M. & N. 253. Hepp, 580. Schaer. 360. (in pt.) Welw. Lusit. 75.

GEOG. DISTRIB:—Europe, Australasia.

BOT. PROV:—7...16...19...31.

SCOTLAND:—Appin, *Rev. J. M. Crombie.*

IRELAND:—Near Dunkerron! *Dr. Taylor.*

WALES:—Dolgelley! *Mr. J. Ralfs.*

CHANNEL ISLANDS:—Jersey. *Mr. Larbalestier.* Guernsey. *Rev. T. Salwey.*

16. *P. conspersa*, (Ehrh.) pale, ochroleucous or sub-stramineous, orbicular, laciniato-divided, laciniae appressed, contiguous or imbricate, margins sinuato-incised or crenate, undulate, under surface fuscous-black or fuscous, medulla

nigro-fibrillose ; apothecia spadiceous or fuscous, margin thin, inflexed ; spores 8, colourless, ellipsoid, simple ; thallus K f + C +, medulla K yellow then red.

On rocks &c. not uncommon. 1741.

SYN :—Ach. Prodr. 118. (1798.) Nyl. Syn. 391.

FIG :—E. Bot. 2097. Hffm. Pl. L. t. 16. f. 2.

EXS :—M. & N. 160. Schær. 379. Bohl. 110. Wright. 77. Maundon 11. Anzi It. S. 108. Leight. 78. Lärbal. 65.

GEOG. DISTRIB :—Throughout the World.

BOT. PROV :—1...5 ..7, 8 ..10, 11...13.. 15...31.

ENGLAND :—Oswestry, Shropshire ! *Rev. T. Salwey*. Battersby Bank, Cleveland ! *Mr. Madd*. Charnwood Forest, Leicestershire ! *Rev. A. Bloxam*. near Dunsford, Devonshire. *Mr. E. Parfitt*. Wensleydale. *Mr. J. W. Watson*. Teesdale, Durham. *Rev. J. Harriman*. Middleton-in-Teesdale, Durham ! North Tyne near Warden Mill, Northumberland. *Mr. Winch*. Bodbury Ring near Church Stretton ! Wrekin ! Corndou !

SCOTLAND :—Bield and Moffat. *Sir J. E. Smith*. Moffat, Dumfriesshire ! Blaeberry Hill. Perth ; Garrynahine, Lewis ; *Dr. Lindsay*.

IRELAND :—On siliceous rocks, not uncommon. *Mr. Carroll*.

WALES :—Dolgelley ; Llanberis. *Dillenius*. (1741.) Conway Mountain !

CHANNEL ISLANDS :—Jersey and Sark ! and other Islands. *Mr. Lärbalestier*.

Weddell in Lich. Prom. publ. says that in *P. conspersa* the medulla when moistened with K becomes yellow, but almost immediately afterwards becomes red. This I am able to confirm fully so far as regards foreign specimens, but on British specimens the yellow reaction takes place, but not always the red.

f. *stenophylla*, (Ach.) laciniae of thallus narrower, much more divided and imbricate.

SYN :—Ach. Meth. 206. (1803.) Nyl. Syn. 391.

EXS :—M. & N. 940. Mass. 313. Anzi It. S. 109. Fellm. 79. Leight. 79.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1...5 ..8...(13...18).

ENGLAND :—Craigfiora near Oswestry, Shropshire ! *Rev. T. Salwey*. Gopsall, Leicestershire ! *Rev. A. Bloxam*. Dunsford, Devon. *Mr. Parfitt*. Wrekin, Shropshire !

SCOTLAND :—Common. *Rev. J. M. Crombie*.

f. *isidiata*, Anzi. centre of thallus densely isidiose.

SYN :—Anzi Cat. p. 28. (1860.)

EXS :—Mass. 314. Anzi It. S. 110. Leight. 79. p.

GEOG. DISTRIB :—Europe.

BOT. PROV :—5...7...12, 13.

ENGLAND :—Keswick, Cumberland ! *Mrs. Stanger*. Wrekin, Shropshire !

SCOTLAND :—Caerlaverock Wood, Dumfries ! *Dr. Lindsay*.

WALES :—Barmouth !

f. *Mougeotii*, Schær. laciniae of the thallus very narrow multifid, somewhat convex, *closely adnate, sulphureo-sorediate*, dark and *sub-diffract* in the centre, paler and yellower in the radiate circumference.

SYN :—Schær. En. 46. (1850.) Nyl. Syn. 392.

EXS :—M. & N. 1234. Schær. 548. Leight. 143. Mudd 74.

GEOG. DISTRIB :—Europe, America.

BOT. PROV :—7, 8...10...12...15...19, 20.

ENGLAND :—Ingleby Moor!; Battersby Moor!; and Hobhole, Cleveland. *Mr. Mudd*, near Thirsk. *Mr. J. G. Baker*, near Staveley. *Mr. Martindale*, Charnwood Forest, Leicestershire. *Rev. A. Bloxam*.

SCOTLAND :—Near Aberdeen. *Prof. Dickie*, near Dunkeld. *Dr. Holl*, Glen Dee in Braemar. *Rev. J. Crombie*.

IRELAND :—Kerry. *Messrs Taylor & Moore*, near Dunkerron. *Dr. Taylor*, Curraghmore, Waterford. *Adm. Jones*.

WALES :—Wall between Bodowen and Glan Mawddach in lane above turnpike road near Barmouth. *Rev. T. Salwey*.

17. *P. sinuosa*, (Sm.) *flavescent, divaricato-lobate*, laciniae narrow, *sinuato-pinnatifid*, *sinuses circular*, apices dilated, cloven, often sorediate, under surface nigro-fibrillose; apothecia fuscous, margin entire; spores 8, colourless, elliptico-oblong, simple, double the size of those of *P. laevigata*; medulla white K yellow then red.

On rocks, walls, &c. 1784.

SYN :—Sm. E. Bot. 2050. (1809.) Ach. Syn. 207. Nyl. Syn. 384.

FIG :—E. Bot. 2050.

GEOG. DISTRIB :—Throughout the World.

BOT. PROV :—1.. 7...13...15, 16...19, 20.. 31.

ENGLAND :—Bournemouth, Devon. *Rev. A. Bloxam*. Rossthwaite, Borrow Dale, Cumberland! *Mr. Robertson*.

SCOTLAND :—Dumfriesshire. *Mr. Burgess*. (1784). Ballacheulish; *Messrs Turner & Hooker*. Badick Castle, Arran! *Sir W. J. Hooker*. Glen Nevis! *Mr. Borrer*.

IRELAND :—Near Kildorrery co. Cork! *Mr. Carroll*. Dunkerron! *Dr. Taylor*. Killarney! *Sir T. Gage*, Glencar. *Mr. J. Taylor*.

WALES :—Barmouth! *Rev. T. Salwey*. Ty Gwyn, near Dolgelley. *Dr. Holl*.

CHANNEL ISLANDS :—common in Jersey and Guernsey. *Mr. Lerbalestier*.

18. *P. acetabulum*, (Neck.) *glauco-olivaceous or lurido-olivaceous*, subopake, orbicular, unequal or rugulose, lobate, lobes *flexuose or imbricate*, under surface castaneo-fuscous or nigricant; apothecia badio-rufous, *receptacle corrugate*, margin *rugoso-crenulate and sorediate*; spores



8, colourless, oblong, simple ; medulla white K yellow then red.

On trees. 1799.

SYN :—Neck. Delic. Gallobelg. 506. (1768.) Ach. Syn. 199. Nyl. Syn. 395.

FIG :—E. Bot. 1652.

EXS :—M. & N. 256. Schær. 547. Zw. 55. Hepp 865. Anzi It. S. 112. Leight. 362. Mass. 25.

GEOG. DISTRIB :—Europe, Africa, N. America.

BOT. PROV :—2, 3, 4, 5...10.

ENGLAND :—Saham Wood, Norfolk. *Sir. J. E. Smith.* (1799). Ickworth Park near Bury. *Rev. G. R. Leathes.* Skutterskelf, Cleveland ! *Mr. Mudd.* near Bilston, Staffordshire ; Beeding Priory, Sussex ! *Rev. A. Bloem.* Stanstead Park, Essex. *Mr. R. Jacob.* near Ripon, Yorkshire. *Mr. W. Brunton.* Bramber Castle, Sussex. *Mr. Larbalestier.* Felix Hall Park, ! Kelvedon ; Rivenhall ; Lyston, Essex. *Mr. Varenne.* near Worcester. *Dr. Holl.*

19. *P. saxatilis*, (L.) cinerascens or albido-cinerascent, orbiculari-expanded, laciniose, *reticulato-rugulose*, *isidioso-scabrous*, laciniae sinuato-multifid or sinuato-incised or lobate, apices retuse ; black and fibrillose beneath ; apothecia spadiceo-badious, or fuscous, margin entire, or crenulate ; spores 8, colourless, elliptical, simple ; medulla K yellow then red.

On rocks, trees, &c. common. 1724.

All forms of *saxatilis* are readily distinguished by the *reticulato-rugulose* thallus.

SYN :—Linn. Fl. Suec. 1075. (1753.) Ach. Syn. 203. Nyl. Syn. 388.

FIG :—E. Bot. 603. Dill. t. 24. f. 83.

EXS :—Anzi It. S. 104 a. Leight. 203. right spec. Fellm. 78. Hepp 860. pt. Schær. 362. Mudd 66.

GEOG. DISTRIB :—Europe, Asia, Africa, N. America.

BOT. PROV :—1...3, 4, 5...7...10, 11...13, 14, 15, 16...18, 19. 31.

ENGLAND :—Ingleby Park, Cleveland. *Mr. Mudd.* Berwick-on-Tweed. *Dr. G. Johnston.* Northumberland and Durham. *Mr. Winch.* Kelvedon, Essex. *Mr. Varenne.* Dunsford, Devon. *Mr. Parfitt.* Midland Counties. *Mr. Purton.* Shotover Hill, Oxford. *Mr. Baxter.* Cambridge. *Rev. R. Relhan.* Oxford. *Dr. Sibthorp.* Bedford. *Rev. C. Abbot.*

SCOTLAND :—Stennis, Orkney ; Ayrshire ! *Dr. Lindsay.* Braid Hermitage and Pentland Hills. *Dr. Greville.* Forfarshire. *Mr. W. Gardiner.* Long Island ; Arran. *Prof. Balfour.*

IRELAND :—Killarney. *Dr. Carrington,* trees and rocks, common. *Mr. Carroll.*

WALES :—Aber. *Rev. Hugh Davies.* Snowdon ! Aran Mowddy !

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.* common on all the Islands, *Mr. Larbalestier.*

Var. *sulcata*, Tayl. whitish or albido-glaucous, *reticulato-sorediate*, *soredia* whitish, *marginated by the ruptured thallus, sulciform, never isidiferous*; medulla K yellow then red.

On trees and walls. 1836.

SYN:—Tayl. in Mack. Fl. Hib. 145. (1836.) Nyl. Syn. 389.

FIG:—Mich. Ord. 22. t. 49. C.D.

EXS:—Anzi It. S. 104. b. Leight. 203. left hand spec.

GEOG. DISTRIB:—Europe.

BOT. PROV:—5...10...15...19...31.

ENGLAND:—Ayton Moor, Cleveland, *Mr. Mudd*. Oswestry and Moor Park near Ludlow! *Rev. T. Salwey*. near Thirsk! *Mr. J. G. Baker*. Walls of the Cemetery! Shrewsbury; Lyth Hill, Shropshire!

SCOTLAND:—Top of Ben Lawers, *Dr. Lindsay*.

IRELAND:—Co. Kerry. *Dr. Taylor*. (1836).

CHANNEL ISLANDS:—Guernsey. *Rev. T. Salwey*.

Var. *fulfuracea*, (Schær.) thallus *densely isidiose*; medulla K yellow then red.

On rocks, stones and trees.

SYN:—*P. horrescens*, Tayl. belongs to this form. Schær. Enum. 45. Mudd Man. 95.

EXS:—Leight. 46. Schær. 363. Hepp 862. 863. M. & N. 349. Bohl. 11. Fellm. 77. Breut. 116.

GEOG. DISTRIB:—Europe.

BOT. PROV:—5...7...10...15...19.

ENGLAND:—Oswestry! *Rev. T. Salwey*. Yorkshire! *Mr. G. Dixon*. Wrekin Hill! Nesscliffe Hill! Haughmond Hill! Shropshire.

SCOTLAND:—Birnam Hill, Dunkeld! *Dr. Lindsay*.

IRELAND:—Near Kildorrery co. Cork! *Mr. Carroll*.

WALES:—Sychnant near Conway! Barmouth! *Rev. T. Salwey*.

Var. *omphalodes*, (L.) *fuscous or nigricant, shining, smoother, reticulato-rugulose*; medulla K yellow then red.

On alpine rocks. 1724.

SYN:—Linn. Sp. Pl. ed. 1. (1753.) Ach. Syn. 203. Nyl. Syn. 388.

FIG:—E. Bot. 604.

EXS:—Schær. 488. Zw. 182. Maudon. 29. Leight. 7. Bohl. 18. M. & N. 348. Mudd 67. Larbal. 19.

GEOG. DISTRIB:—Europe, Asia.

BOT. PROV:—1...5...7, 8...10...12...15, 16...18...22...31.

ENGLAND:—Cromford Moor near Matlock, Derbyshire. *Sir J. E. Smith*. Cumberland! *Mrs. Stanger*. near Torquay. *Dr. Deakin*. Howden Gill, Cleveland! Kildale Moor! *Mr. Mudd*. Craigforda near Oswestry! *Rev. T. Salwey*. Berwick-on-Tweed! *Dr. G. Johnston*. Hornby and Helmsley, Yorkshire. *Mr. Teesdale*. near Penzance and Redruth. *Messrs Turner & Sowerby*. Northumberland and Dur-

ham. *Mr. W. W. Tors of Dartmoor. Mr. Parfitt. Malvern Hills. Rev. W. S. Rufford. Stiperstones Hill! Shropshire.*

SCOTLAND:—*Amulree, Perthshire! Clova, Forfarshire! Garrynahine, Lewis; Dr. Lindsay. Pentland Hills. Dr. Greville. Sidlaw Hills and Clova Mountains. Mr. W. Gardiner. Long Island. Prof. Balfour.*

IRELAND:—*Lough Bray co. Wicklow. Dr. Taylor.*

WALES:—*Aber. Rev. Hugh Davies. near Aberdovey! Rev. A. Bloom. Corwen Mountain! Barmouth! Aran Mowddu!*

CHANNEL ISLANDS:—*Beauport Bay, Jersey! and all the other Islands. Mr. Larbalestier. Guernsey. Rev. T. Salwey.*

Var. *pinniformis*, Ach. cinerascens, narrowly laciniato-dissected, imbricato-crustaceous; medulla K yellow then red.

On rocks.

SYN:—Ach. Meth. 204. (1803.) Syn. 203. Nyl. Syn. 388.

FIG:—*Westr. Farg. t. 7. f. 6.*

EXS:—*Schar. 364. Anzi Langob. 294. Hepp 861. 864. Korb. 243. M. & N. 738.*

GEOG. DISTRIB:—Europe.

BOT. PROV:—5. (13---18).

ENGLAND:—*Stiperstones Hill, Shropshire!*

SCOTLAND:—very plentiful and fertile. *Rev. J. M. Crombie.*

### *E. medulla K—C red.*

20. *P. laevigata*, (Sm.) albo-glaucescent or whitish, narrowly laciniato-lobate, *lacinae divaricate sinuato-multifid or sinuato-incised*, often subimbricate and tuberculato-sorediate at the apices, laxly affixed, under-surface black and atro-fibrilloso-rhizinose; apothecia badiorufous or fuscous, margin entire or obsoletely crenate or sorediate; spores 6—8, colourless, elliptical, simple; medulla white K—C red.

On rocks and walls. 1808.

SYN:—Sm. E. Bot. 1852. (1808.) Ach. Syn. 212. Nyl. Syn. 384.

FIG:—*E. Bot. 1852.*

EXS:—*Schar. 561. Mudd 69. Nyl. 112. Spruce Amaz. 132. 176. Larbal. 64.*

GEOG. DISTRIB:—Europe.

BOT. PROV:—1, 2...7...17...19, 20...31.

ENGLAND:—*Lynton, N. Devon! Mr. Mudd. Two Bridges, Dartmoor!; above the Plym by the Dewar Stone, Dartmoor! St. Leonard's Forest! Eridge Rocks! Mr. Borrer. Bolt Head, S. Devon! Dr. Holl.*

SCOTLAND:—*Ballacheulish! Rossshire! Mr. Borrer.*

IRELAND:—*Southern Counties! Miss Hutchins. Dunkerron! Askew Wood co. Kerry! Dr. Taylor.*

WALES :—Anglesea and Carnarvonshire ! *Rev. H. Davies.* (1808.) Mountains above Barmouth ! *Mr. Borrer.* Dolgelley ! near Llanberis ! *Dr. Holl.* near Aberdovey. *Rev. A. Bloxam.*

CHANNEL ISLANDS :—N.E. coast Jersey ! *Mr. Larchestier.* Guernsey. *Rev. T. Salwey.*

21. *P. incurva*, (Pers.) ochroleucous or flavido-cinerascent, sub-opake, orbicular, stellato-laciniose, appressed, laciniae narrow, multifid, somewhat convex, crowded, apices incurved and imbricate, soredia albo-flavescent, verrucoso-tuberculose, under surface concolorous, rhizinae nigricant; apothecia spadiceo-fuscous or dark rufescent, small, margin sub-entire; thallus K f + C +, medulla K—C faint red.

On rocks, very rare. 1793.

SYN:—Pers. in *Ust. Ann.* 7. p. 24. (1794.) *Nyl. Syn.* 394.

FIG:—Dicks. *Cr. Br.* t. 9. f. 7.

EXS:—Tuck. 76. Fr. 259.

GEOG. DISTRIB:—Europe, N. America.

BOT. PROV:—8.. 11...15...19...23...30.

ENGLAND :—Teesdale, Durham. *Rev. J. Harriman.* Beamish Moor and Eglestone Fell, Durham; Hedgehope and Cheviot, Northumberland. *Mr. Winch.* Charnwood Forest, Leicestershire. *Rev. A. Bloxam.*

SCOTLAND:—Braemar; Grampians. *Rev. J. M. Crombie.*

IRELAND:—Dunkerron co. Kerry. *Dr. Taylor.* Howth; Killarney; and Knocklyd co. Antrim. *Dr. Moore.*

E. medulla of thallus yellow, K yellowish brown.

22. *P. endochlora*, Leight. like *laevigata*, whitish, very uneven, laciniae sinuato-lobate, retuse, tuberculoso-nigricanti-sorediate, medulla yellow, K yellowish-brown; apothecia rufous-brown, receptacle verrucose reticulato-lacunose, margin verrucose incurved; spores as in *laevigata*.

On rocks,

GEOG. DISTRIB :—Europe.

BOT. PROV:—19.

IRELAND :—Dunkerron !; Askew Wood co. Kerry. *Dr. Taylor.*

Much resembling *P. tiliacca* var. *rugosa*, Tayl. It may be *P. aurulenta*, Tuck. *Suppl.* 1. 424 but I have seen no authentic specimen.

### SUB-TRIBE III. PHYSCIEI.

Thallus laciniate, variously divided, generally stellato-orbicular. Apothecia orange or yellow or nigricant,

lecanorine. Paraphyses distinct. Spores colourless or fuscous, bilocular or 1-septate. Sterigmata pluri-articulate. Spermatia oblongo-cylindrical, incrassate at the apices.

## V. PHYSCIA, *Nyl.*

Characters as above.

### *A. Thallus flavescent (K purple.)*

1. *P. flavicans*, (Sw.) yellow or orange yellow, caespitose, sub-terete, slender, entangled, much branched, branches attenuate, furcellate at the apices; apothecia orange or rufous, margin thin, sub-entire; spores 8, colourless, elliptico-oblong, polari-bilocular.

On trees, rocks, &c. 1724.

SYN:—Swartz Prodr. Fl. Ind. 147. (1788.) Ach. Syn. 224. Nyl. Syn. 406.

FIG:—E. Bot. 2113. Hepp Sporen t. 65. f. 570.

EXS:—Hepp 570. Schær. 551. Welw. Lusit. 11. Spruce Amaz. 171. Lerb. 21. Mudd 84. Leight. 169. Mass. 17.

GEOG. DISTRIB:—W. Europe, Asia, Africa, America, Australasia.

BOT. PROV:—1, 2 ..7...10...18, 19, 20 ..31.

ENGLAND:—Near Lewes, Sussex! *Mr. Borrer*. Devonshire. *Sir J. E. Smith*. Penzance! *Rev. T. Salwey*. near Settle, Yorkshire. *Dr. Windsor*. near Hastings; Isle of Wight; S. Devon and Cornwall, generally; South Brent, Devonshire. *Dr. Holl*. Dunsford; Budleigh Salterton, Devon. *Mr. Purfill*. Brockenhurst, New Forest. *Rev. J. M. Crombie*.

SCOTLAND:—Craig of Ailsa. *Rev. J. Lightfoot*.

IRELAND:—Ardglass. *Dr. Maingay*. near Waterford. *Dr. Barker*. Dublin Mountains and Killiney Hill. *Dr. Taylor*. Lambay Island near Dublin; Ardmore, Waterford, Castlemartyr, Lisquinlan, Castle bernard and Cape Clear Island co. Cork; Western Blasquet Island, Kerry. *Mr. Carroll*. Kinsale. *Mr. J. Cooke*.

WALES:—Moel-y-Golfa near Welshpool and Pieton, Pembroke-shire. *Rev. T. Salwey*. Aberdovey. *Rev. A. Bloxam*. Rocks N. of Barmouth!

CHANNEL ISLANDS:—Rozel; L'Etacq; St. Lawrence; La Moye, Jersey! Island of Sark! Jerbourg, Guernsey; Brechou. *Mr. Langlestier*.

2. *P. chrysophthalma*, (L.) yellow or flavo-albicant or flavo-cinerascent, rigescent, narrowly laciniate, laciniæ ascending, divaricato-multifid, apices fibrilloso-ramulose or spinose, whitish beneath; apothecia orange, margin



fibrilloso-ciliate, sometimes naked ; spores 8, colourless, elliptico-oblong, polari-bilocular.

On trees. 1801.

SYN:—Linn. Mant. 2, 311. (1771.) Ach. Syn. 224. Nyl. Syn. 410.

FIG:—E. Bot. 1088. Hfsm. Pl. L. t. 36. f. 1: and t. 31. f. 1. Hepp Sporen t. 65. f. 569.

EXS:—Hepp 569. M. & N. 254. Mass. 55. 56. Larb. 22. Welw. Lusit. 64. 69. Schær. 389. Bohl. 322. Leight. 394.

GEOG. DISTRIB:—Europe, Africa, America, Polynesia, Australasia.

BOT. PROV:—19, 20...30, 31.

ENGLAND:—Devonshire. *Mr. Sowerby*. (1801.) Lancing! and Brighton! Sussex. *Mr. Borrer*. near Lewes, Sussex. *Mr. Unwin*. near Settle, Yorkshire. *Dr. Windsor*. near Torquay. *Sir W. J. Hooker*.

IRELAND:—Balluirea, Carrigalim ; near Cork, ; near Newcastle co. Down. *Mr. Carroll*. Cave Hill near Belfast. *Prof. Dickie*. Killrittain. *Mr. Alexander*. Vernonmount and Blarney, Cork, and Castlebernard Park, Bandon. *Mr. J. Sullivan*. Berborough, Cork. *Mr. Cooke*. Muckrone! *Mr. Hardy*.

CHANNEL ISLANDS:—Guernsey ; St. Brelade's Jersey! and Sark! *Mr. Larbalestier*. orchard at Sark. *Rev. T. Salwey*.

The forma *Dickiana* (Linds. Mem. SpERM. 254.) seems only a paler coloured state with entire margin to the apothecia. It has occurred at Cave Hill, Belfast and Newcastle co. Down. *Dr. Dickie*. and Noirmont, Jersey. *Mr. Larbalestier*.

3. *P. parietina*, (L.) yellow, sub-orbicular, membranaceous, *rotundo-lobato-incised*, lobes sub-imbricate, appressed, plane or sub-concave, *smooth*, margins crenate, thickened and upturned, under surface paler or whitish ; apothecia concolorous or waxy-orange-coloured, margin *entire* ; spores 8, colourless, oblong, polari-bilocular.

On trees, pales, rocks, &c. common. 1690.

SYN:—Linn. Sp. Pl. ed. 1. No. 25. (1753.) Ach. Syn. 290. Nyl. Syn. 410.

FIG:—E. Bot. 194. Tul. Mem. t. 1. f. 1—7.

EXS:—Schær. 380. Mass. 31. 32. Welw. Lusit. 82. Bohl. 12. M. & N. 66. Maudon. 34. Anzi It. S. 130. Mudd 85. Leight. 10. Hepp 870. Larbal. 67.

GEOG. DISTRIB:—Europe, Asia, Africa, N. America.

BOT. PROV:—1...3, 4, 5...8...10, 11.. 15, 16...18. (19—30.) 31.

ENGLAND:—Charnwood Forest! Leicestershire. *Rev. A. Blouam*. Yorkshire! *Mr. Dixon*. Ayton! Cleveland. *Mr. Mudd*. Northumberland and Durham. *Mr. Winch*. Baggypoint, N. Devon. *Mr. Parfitt*. Kelvedon, Essex. *Mr. Varenne*. Midland Counties. *Mr. Purton*. Bedfordshire. *Rev. C. Abbot*. Cambridge. *Rev. R. Rulhan*. Shropshire!

SCOTLAND:—Long Island; Arran. *Prof. Balfour*. Forfarshire. *Mr. Gardiner*. Hebrides and Orkneys. *Dr. Lindsay*.

IRELAND:—On trees, rocks, &c., common. *Mr. Carroll*.

CHANNEL ISLANDS:—Jersey! Sark. Herm. Jethou. Crévichou. *Mr. LARBALÉSTIER*. Guernsey. *Rev. T. SAWEY*.

Var. *aureola*, Ach. *more intense yellow or orange, rotundo-lobate, sinuato-incised, crenate, thickened and upturned at the margins, under a lens very minutely granulate on the surface, margin of apothecia crenulate.*

On rocks and stones.

SYN:—Ach. L. U. 487. (1810.) Syn. 210. Nyl. Syn. 411.

EXS:—Mass. 34. Rabh. 773. Arn. 65.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1...15.

ENGLAND:—Exeter. *Mr. Parfitt*.

SCOTLAND:—Kincardineshire. *Rev. J. M. Crombie*.

Var. *ectanea*, (Ach.) *yellowish-orange, multifido-laciniate, laciniae narrow, imbricated, sub-convex, sub-lacunose, thickened at the margins, slightly granulated on the surface; margin of apothecia crenulate.*

On rocks.

SYN:—Ach. L. U. 464. (1810.) *rutilans*, Syn. 210. Nyl. Syn. 411.

EXS:—Anzi Ven. 167. Zw. 57. Welw. Lusit. 72.

GEOG. DISTRIB:—Europe, Africa, N. America, Chili, Australasia.

BOT. PROV:—6, 7.

WALES:—Tenby! *Mr. Lees*. Borth!

Var. *laciniosa*, (Duf.) *orange-coloured, stenophyllous, lacero-or pinnatifido-dissected, stellato-appressed, more or less ascending.*

On trees, rocks, &c.

SYN:—Fr. L. E. Ref. 73. Mudd Man. 113.

FIG:—E. Bot. 1794.

EXS:—Schær. 351. Anzi Langob. 296. 255. (left sp.) Mass. 36. Hepp 872. 633. Leight. 11.

GEOG. DISTRIB:—Europe.

BOT. PROV:—3.. 5...14.

ENGLAND:—Yergham, Essex. *Mr. Varcune*, near Shrewsbury!

SCOTLAND:—Blackford Hill near Edinburgh. *Sir J. E. Smith*.

Var. *tychnea*, Ach. *orange-coloured, pulvinate, crowded, rotundo-squamulose, ascendent-imbricate, margins granuloso-pulverulent or lacero-dissected; margin of apothecia, entire, pulverulent.*

On trees.

SYN:—Ach. Meth. 187. (1803.) Syn. 210. Nyl. Syn. 411.

EXS:—Schær. 382. 549. Anzi Langob. 58. Hepp 871. 872. 873. Fellm. 86.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1.. 5...15...19...29...30.

ENGLAND:—Shropshire! *Rev. T. Salwey*. Hay Tor, Dartmoor; Malvern Hills. *Dr. Holl*.

SCOTLAND:—Ben Lawers. *Dr. Holl*. Braemar and Blair Athole. *Rev. J. M. Crombie*.

IRELAND:—North of Ireland; and Castlebernard Park, Bandon. *Adm. Jones*.

Var. *polycarpa*, (Ehrh.) greenish-yellow, *granulato-conglomerate*, *margins granulato-crenate*; *apothecia numerous, crowded, margin turgid, entire*.

On trees, palings, and rocks. 1807.

SYN:—Ehrhart Crypt. 136. (1785.) Ach. Syn. 192. Nyl. 411.

FIG:—E. Bot. 1795.

EXS:—Hepp 54. 595. Mass. 35. Mudd 86. Anzi Langob. 295. Leight. 12. 265. Arn. 497.

GEOG. DISTRIB:—Europe, N. America.

BOT. PROV:—1.. 3, 4, 5...10...15.

ENGLAND:—Near Yarmouth *Mr. Turner*. (1807.) Stokesley! Redcar! Cleveland. *Mr. Mudd*. Budleigh Salterton, Devon. *Dr. Dickie*. Midland Counties; Christ Church Meadow, Oxford. *Mr. Purton*. Bradley Green, Worcestershire. *Rev. W. S. Rufford*. Long Mynd! near Shrewsbury! Shropshire.

SCOTLAND:—Durrus, Kincardineshire. *Rev. J. M. Crombie*.

### B. *Thallus cinerascens*.

#### § K—C—.

4. *P. intricata*, (Desf.) cinereous or cinerascens, *cæspitose, narrowly tereti-compressed, laciniata, densely puberulo-villose*, *laciniae divaricato-ramose, entangled, obsoletely canaliculate beneath*; *apothecia lateral, sessile, fuscous-black, plane, margin entire downy*; *spores 8, colourless, elliptico-oblong, 1-septate*.

On trees and rocks, rare. 1804.

SYN:—Desfontaines Fl. Atlant. 2. 419. (1800.) *atlantica*, Nyl. Syn. 408. Ach. Syn. 223.

FIG:—E. Bot. 1715. Nyl. Syn. t. 8, f. 50.

EXS:—Mudd 76. Bourgeau. 610. Welw. Lusit. 14.

GEOG. DISTRIB:—W. Europe, Africa.

BOT. PROV:—1, 2.

ENGLAND:—Cliffs near Hastings, Sussex! Braeklesham in Selsey Island; *Mr. Borrer*. (1804.) Bolt Head, Devon. *Rev. J. M. Crombie*.

5. *P. ciliaris*, (L.) *albido-cinerascens* or *cinerascens*.

*fuscuscent, linearilaciniate, laciniae sub-ascending, multifid, imbricato-intricate, tomentose, canaliculate, whitish beneath, margins fibrilloso-ciliate; apothecia pedicellate, fuscous-black, caesio-pruinose, rarely naked, margin subentire, inflexed; spores 8, fuscous, oblong, 1-septate.*

On trees and rocks. 1785.

SYN :—Linn. Sp. Pl. ed. 1. No. 28. (1753.) Ach. Syn. 220. Nyl. Syn. 414.

FIG :—Hffm. Pl. L. t. 3. f. 4. Hepp Sporen t. 19. f. 168.

EXS :—Hepp 168. Schær. 388. M. & N. 64. Larbal. 68.

GEOG. DISTRIB :—Europe, Africa, N. America.

BOT. PROV :—1...3, 4, 5...8...14, 15...21...31..

ENGLAND :—Leicestershire ! *Rev. A. Bloram.* Kelvedon, Essex. *Mr. Varenne.* common in Devon. *Mr. Parfitt.* Midland Counties. *Mr. Purton.* Cambridge. *Rev. R. Rolhan.* Oxford. *Dr. Sibthorp.* Bedfordshire. *Rev. C. Abbot.* Shropshire !

SCOTLAND :—Balthayock ! Perth. *Dr. Lindsay.* Baldovan ; Mains ; Auldbar ; Foulis. *Mr. Gardiner.* Castle of Melgund ; between Forfar and Kirriemuir. *Mr. Croall.* Auchindenny and Rosslyn Woods ; Dalkeith ; about Kirkliston. *Dr. Greville.*

IRELAND :—Oakpark near Carlow. *Dr. Moore.*

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.* Jersey and Sark ! *Mr. Larbalestier.*

forma *actinota*, Ach. margin of apothecia *proliferous, laciniolae sub-fimbriate.*

On trees. 1724.

SYN :—Ach. L. U. 497. (1810). Nyl. Lich. Scand. 108.

FIG :—E. Bot. 1352.

EXS :—Rabh. 309. Mudd 77. Mass. 39.

GEOG. DISTRIB :—Europe.

BOT. PROV :—10, 11...15.

ENGLAND :—Near Ayton, Cleveland ! *Mr. Mudd.* Yorkshire ! *Mr. Dixon.* Northumberland and Durham. *Mr. Winch.*

SCOTLAND :—Old Castle of Melgund, Forfarshire ! *Dr. Lindsay.*

forma *verrucosa*, Ach. laciniae broader, *verrucoso-papillate, spermogoniferous.*

On trees.

SYN :—Ach. L. U. 497. (1810). Nyl. Lich. Scand. 109.

EXS :—Bohl. 38. Anzi Langob. 258. A.

GEOG. DISTRIB :—Europe.

BOT. PROV :—3...5...7...10...15.

ENGLAND :—Llanfoida near Oswestry ! *Rev. T. Salwey.* near Datchet ! *Miss Atwood.* near Thirsk ! *Mr. Baker.* between South Littleton and Badsey, Warringtonshire. *Mr. Purton.*

SCOTLAND :—Balthayock, Perth ! *Dr. Lindsay.*

forma *saricola*, Nyl. *dark cervine* or *fuscous*, appressed.

On maritime rocks.

SYN :—Nyl. Syn. 414.

GEOG. DISTRIB :—Europe, Canaries.

BOT. PROV :—1...7, 8...10...15...19...31.

ENGLAND :—Near Langbrough, Cleveland. *Mr. Mudd.* near Buxton. *Dr. Holl.* Devon. *Mr. Parfitt.*

SCOTLAND :—Morrone in Braemar. *Rev. J. M. Crombie.*

IRELAND :—Sybil Head co. Kerry. *Mr. Carroll.*

WALES :—Holyhead Mountain!

CHANNEL ISLANDS :—Quenvais, Jersey. *Mr. Larbalestier.*

6. *P. pulverulenta*, (Schreb.) pallido-cinerascent or pale cinereo-rufescent or pale olivaceo-cervine, opaque, *suborbiculato-stellate*, appressed, firm, laciniae plane, multifid, *minutely albo-granuloso-pruinose towards the obtuse crenato-incised apices*, under surface nigricanti-fibrillose; apothecia fuscous caesio-pruinose, margin tumid, entire, pruinose; spores 8, fuscous, oblong, 1-septate.

On trees, common.

SYN :—Schreb. Spicil. 128. (1771.) Ach. Syn. 214. Nyl. Syn. 419.

FIG :—Hffm. Pl. L. t. 8. f. 2. Hepp Sporen t. 99. f. 874.

EXS :—M. & N. 162. (in part) Anzi It. S. 122. Schaer. 356. Hepp 874. (in part).

GEOG. DISTRIB :—Europe, Africa, N. America.

BOT. PROV :—1...3...5...10, 11...14, 15...(19—30)...31.

ENGLAND :—Northumberland and Durham. *Mr. Winch.* Devon. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varnne.* Midland Counties. *Mr. Purton.* near Shrewsbury! and Shropshire! generally.

SCOTLAND :—Common on trees. *Sir W. J. Hooker.* Forfarshire. *Mr. W. Gardiner.* Braid Hermitage; Blackford House; Swanston Wood near Edinburgh. *Dr. Greville.*

IRELAND :—On trees, common. *Mr. Carroll.*

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salway.* common on all the Islands. *Mr. Larbalestier.*

f. *pityrea*, (Ach.) thallus thinner, sub-cinerascent, sub-effuse, *laciniae shortish, sorediate at the margins, margin of apothecia crenulate or sorediato-lacerate.*

On trees and walls. 1783.

SYN :—Ach. Prodr. 123. (1798.) Syn. 201. Nyl. Syn. 420.

FIG :—E. Bot. 2064.

EXS :—M. & N. 352. (in part) Schaer. 487. (in part) Mudd 83. Zw. 186. Arn. 256. Hepp 876.

GEOG. DISTRIB :—Europe

BOT. PROV :—1...3, 4, 5. 13...15.

ENGLAND :—Strumpshaw; Norfolk and Suffolk. *Sir J. E. Smith.*



Pury. *Rev. G. R. Leathes*. Oswestry ! ; Castle Walks, Ludlow ! *Rev. T. Salwey*. Cambridge. *Mr. Lorbalestier*. Countess Weir, Devon. *Mr. Parfitt*. Pophills, Warwickshire. *Rev. W. S. Rugford*. near Oxford. *Mr. Baxter*. Oversley, Warwickshire. *Mr. Purton*.

SCOTLAND :—Glasgow. *Dr. Scouler*. Marten's Den, Forfarshire. *Mr. Croall*.

*f. angustata*, (Hffm.) smaller, *pallido-cinereo-rufescent*, *laciniae* narrower linear, dichotomous.

On moss. 1861.

SYN:—Hffm. Enum. 77. (1784.) Ach. Syn. 214. Nyl. Syn. 426 Mudd Man. 110.

FIG :—Hffm. Enum. t. 11. f. 2.

EXS :—Anzi Langob. 54.

GEOG. DISTRIB :—Europe.

BOT. PROV :—10.

ENGLAND :—Yorkshire. *Mr. Mudd*.

*f. muscigena*, (Whlrb.) darker, *cervino-fuscescent*, generally *albo-caesio-pruinose*, *laciniae* shorter, more *compact*, *ascending*.

On moss. 1861.

SYN:—Whlrb. Fl. Lapp. 422. (1812.) Ach. Syn. 212 Nyl. Syn. 429

FIG :—Mudd Man. 110.

EXS :—Schær. 486. Arn. 64. Anzi Langob. 54. B. Venet. 21 Hepp. 875.

GEOG. DISTRIB :—Europe.

BOT. PROV :—5 ..10...15.

ENGLAND :—Yorkshire *Mr. Mudd*. Malvern Hills. *Dr. Holl*.

SCOTLAND :—Ben Lawers. *Dr. Holl*.

*f. venusta*, (Ach.) *cervine*, epruinose, margin of apothecia crowned with *laciniolæ* or horizontal thalline lobulæ.

On trees. 1724.

SYN :—Ach. Meth. 211. (1803.) Syn. 212. Nyl. Syn. 420,

FIG :—Ach. Meth. t. 8. f. 5. E. Bot. 2063.

EXS :—M. & N. 162. (in part) Schær. 356. (in part) Maudon. 33. Hepp 874. (in part) Anzi It. S. 123. Bohl. 69. Mudd 182.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1 ..3, 4, 5...10...15...19.

ENGLAND :—Yorkshire ! *Mr. G. Dixon*. near Ayton ! Cleveland. *Mr. Mudd*. Wrenbury, S. Devon. *Dr. Holl*. Cambridge. *Rev. R. Relhan*. Oxford. *Dr. Sibthorp*. Emsdon near Shrewsbury !

SCOTLAND :—Lochaber. *Rev. J. M. Crombie*.

IRELAND :—Blarney ! and near Cork. *Mr. Carroll*.

All the various forms or states of *P. pulverulenta* are readily recognized by the thallus generally or the apices of the laciniae being clothed with minute albo-granulose pruina and the chemical reaction K—C—.

7. *P. obscura*, (Ehrh.) *olivaceo-virescent* or *fuscous*, sub-orbiculari-stellate, *appressed*, *laciniae* *narrow inciso-lobate*, *plane*, *smooth*, margins often *sorediate*, under surface *nigro-fibrillose-ciliate*; apothecia *nigro-fuscous*, *naked*, *margin pale*, *entire*; spores 8, *fuscous*, *elliptico-oblong*, *1-septate*.

On trees &c. 1808.

SYN :—Ehrhart Crypt. 177. (1785.) Nyl. Syn. 427. *P. cyclozelis*, Ach. Syn. 216.

FIG :—E. Bot. 1942. Hepp Sporen t. 68. f. 596.

EXS :—Nyl. 33. Hepp 597. Schær. 355. Anzi It. S. 125- Mudd 80. Leight. 80.

GEOG. DISTRIB :—Europe, Asia, Africa, Australasia.

BOT. PROV :—2, 3, 4, 5...8...10, 11...14...16...(19...30.)...31.

ENGLAND :—Lakenham; Seething, Norfolk; Gisleham, Suffolk. Sir J. E. Smith. (1808.) Sussex. Mr. Borrer. Yarmouth. Mr Turner. near Ayton! and Easby! Cleveland. Mr. Mudd. Northumberland and Durham. Mr. Winch. Kelvedon, Essex. Mr. Varenne. Gopsall Park, Leicestershire. Rev. A. Bloxam. Upton Magna! and other places near Shrewsbury; Llanymynech!

SCOTLAND :—Appin, Argyleshire. Capt. Carmichael. near Colinton. Dr. Greville.

IRELAND :—Common on rocks and trees. Mr. Carroll.

CHANNEL ISLANDS :—Guernsey. Rev. T. Salwey. common on all the Islands. Mr. Larbalestrier.

Var. *chloantha*, (Ach.) *glaucous-green* or *cinereous*, *laciniae* *broad*er and *more approximate*, apothecia *very numerous*.

On trees &c.

SYN :—Ach. Syn. 217. (1814.) Nyl. Lich. Scand. 112.

EXS :—Schær. 353. 354. Hepp 596. Anzi Langob. 293. Venet. 22. It. S. 124. Mudd 81.

GEOG. DISTRIB :—Europe.

BOT. PROV :—10.

ENGLAND :—Ayton! Cleveland. Mr. Mudd.

Var. *virella*, (Ach.) *glauco-virescent* or *cinereous*, stellate, *laciniae* *abbreviated*, *laciniato-lobate*, *obtuse*, *sorediate*. K—C—.

On trees, &c. 1807.

SYN :—Ach. Prod. 108. (1798.) Syn. 191. Nyl. Syn. 427.

FIG :—E. Bot. 1696. (2 upper fig).

EXS :—Hepp 599. Anzi It. S. 126. Bohl. 104.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1, 2, 3...6.

ENGLAND :—Sussex. Mr. Borrer. (1807.) near Oxford. Mr. Baxter. South of England. Rev. J. M. Crambie.

WALES :—South Wales. Rev. J. M. Crambie.

Var. *ulothrix*, (Ach.) base of *receptacle* of apothecia *nigro-fibrillose*.

On trees &c. 1807.

SYN:—Ach. Prod. 113. (1798.) Syn. 217. Nyl. Syn. 423.

FIG:—E. Bot. 1696. (lower fig).

EXS:—M. & N. 448. Fellm. 88, Anzi It. S. 127.

GEOG. DISTRIB:—Europe.

BOT. PROV:—2...5...15...19...30...31.

ENGLAND:—Sussex. Mr. Borrer. Shropshire! Rev. T. Salwey.

SCOTLAND:—Glen Fendor, Blair Athole, Rev. J. M. Crombie.

IRELAND:—Near Belfast. Mr. Templeton. Dunkerron. Dr. Taylor.

CHANNEL ISLANDS:—Guernsey. Rev. T. Salwey.

Var. *adglutinata*, (Flk.) *olivaceo-virescent*, dark, orbicular, imbricato-stellate, *laciniae* narrow, closely appressed, multifid, surrounding the *leprose sorediate* centre K—C—.

On trees &c. 1810.

SYN:—Flk. in Moug. St. Vog. 543. (1818).

FIG:—Hepp Sporen t. 7. f. 55.

EXS:—Nyl. 34. Mass. 246. Anzi Langob. 373. It. S. 129. Hepp 55. Schær. 609. Wright. 90. M. & N. 543.

GEOG. DISTRIB:—Europe, Cuba.

BOT. PROV:—1, 2...4...(19...30)...31.

ENGLAND:—Norwich. Sir J. E. Smith. Sussex! Mr. Borrer. near Exeter. Rev. J. M. Crombie.

IRELAND:—On trees frequent. Mr. Carroll. Dunkerron. Dr. Taylor.

CHANNEL ISLANDS:—St. Ouen's. Jersey, Mr. Larbalestier.

§§ K + C + .

8. *P. leucomela*, (L.) whitish or *albido-glaucouscent*, *subcespitose*, *linearilaciniate*, *laciniae* lax, diffuse, subascending, margin *nigro-fibrilloso-ciliate*, under surface subcanaliculate or plane, *albo-granulose*; apothecia *cæsio-pruinose*, margin *radiato-coronate*; spores 8, fuscous, elongato-oblong, 1-septate.

Amongst grass &c. 1813.

SYN:—Linn. Sp. Pl. ed. 3. 1613. (1764.) Ach. Syn. 222. Nyl. Syn. 414.

FIG:—E. Bot. 2548. Hepp Sporen t. 66. f. 573.

EXS:—Hepp 573. M. & N. 941. Bourgeau 298. Welw. Lusit. 79. Leight. 168. Larbal. 69.

GEOG. DISTRIB:—Europe, Asia, Africa, America, Australasia.

BOT. PROV:—1...16...31.

ENGLAND :—Babbicombe, Devonshire. *Sir W. J. Hooker*. Torquay ! *Dr. Deakin*. Cornwall ! *Mr. Borrer*. Bolt Head, S. Devon. *Dr. Holl*.

IRELAND :—Ballycotton ! near Cork and on Cape Clear Island. *Mr. Carroll*.

CHANNEL ISLANDS :—Jerbouurg and S. W. point of Rocquaine Bay. *Mr. Lukis*. Grosnez Castle, Quenvais, Jersey ! Bruchere. *Mr. Larbalestier*.

9. *P. speciosa*, (Wulf.) *white* or *albo-cinerascent*, *stellato-laciniate*, laciniae *narrow*, *multifid*, *plane*, sub-imbricate, somewhat ascending at the apices, *under surface plane albo-flocculose*, rhizinae and marginal ciliae whitish ; apothecia fuscous, margin sub-entire or crenulate, incurved ; spores 8, fuscous, oblong, 1-septate.

On trees and rocks. 1809.

SYN :—Wulfen in Jacq. Coll. 3. 119. (1789.) Ach. Syn. 211. Nyl. Syn. 416.

FIG :—E. Bot. 1979.

EXS :—M. & N. 635. Schær. 357. Tuck. 81. Spruce Amaz. 154. Anzi Langob. 56.

GEOG. DISTRIB :—Europe, Asia, Africa, America, Polynesia, Australasia.

BOT. PROV :—1...15, 16...19...30, 31.

ENGLAND :—Poldeseo ! Cornwall. *Mr. Borrer*. Bolt Head, S. Devon. *Dr. Holl*.

SCOTLAND :—Ballacheulish near Fort William. *Messrs Turner & Hooker*. Glen Falloch. *Dr. Holl*. Appin. *Rev. J. M. Crombie*.

IRELAND :—Dunkerron. *Dr. Taylor*. Glenarm co. Autrim. *Dr. Moore*.

CHANNEL ISLANDS :—Jerbouurg, Guernsey. *Rev. T. Salwey*. Rozel, Jersey. *Mr. Larbalestier*.

10. *P. stellaris*, (L.) *white* or *albo-glaucouscent*, orbicular, *stellari-appressed*, laciniae multifid, contiguous, *sub-cortically albo-maculate*, under surface whitish with concolorous or fuscouscent or nigricant fibrillae ; apothecia fuscous-black or black, naked or caesio-pruinose, margin entire or obsoletely crenulate ; spores 8, fuscous, oblong, 1-septate ; cells nucleolate.

All the varieties or forms of *P. stellaris* may be recognized by the sub-cortically albo-maculate thallus.

On trees. 1724.

SYN :—Linn. Sp. Pl. 1. ed. No. 27. (1753.) Ach. Syn. 215. Nyl. Syn. 424.

FIG :—E. Bot. 1697. Hffm. En. t. 13. f. 1. 2. Tul. Mem. t. 1. f. 8—16.

EXS:—M. & N. 163. Schar. 350. 351. Mudd 79. Mass. 318. Fellm. 87. Hepp 877. Bohl. 103. Anzi It. S. 117.

GEOG. DISTRIB:—Europe, Asia, Africa, N. America, Australasia.

BOT. PROV:—1...3, 4, 5.. 7...10, 11...14, 15...19.. 31.

ENGLAND:—Near Ayton! *Mr. Mudd*. Oswestry! *Rev. T. Salwey*. Yorkshire! *Mr. Dixon*. Essex! *Mr. Piggott*. Ravensworth and Cawsey Woods; West Dipton near Hexham and Oak Wood near Wylam, Northumberland. *Mr. Winch*. Devon. *Mr. Parfitt*. Kelvedon, Essex. *Mr. Verrane*. Midland Counties. *Mr. Purton*. Bedfordshire. *Rev. C. Abbot*. Cambridge. *Rev. R. Relhan*. Oxford. *Dr. Sibthorp*. Sutton! Berwick! Emsdon! Pulley! Shropshire.

SCOTLAND:—Glen Nevis! *Dr. Lindsay*. Forfarshire. *Mr. Gardiner*. Swanston Wood, near Edinburgh. *Dr. Greville*.

IRELAND:—Great Island, Cork. *Mr. Carroll*.

WALES:—Barmouth!

CHANNEL ISLANDS:—Guernsey. *Rev. T. Salwey*. Jersey. *Mr. Carbastier*.

Var, *leptalea*, Ach. narrowly laciniate, *laciniae appressed, subcortically albo-maculate, margins albo- or fuscescenti-fibrilloso-ciliate*.

On trees and stones.

SYN:—Ach. Meth. 198. (1893.) Syn. 221. Nyl. Syn. 425.

FIG:—Jacq. Coll. 4. t. 6. f. c.

EXS:—Schar. 562. 349, Welw. Lusit. 73. Anzi It. S. 118. M. & N. 450 b. (in part).

GEOG. DISTRIB:—Europe.

BOT. PROV:—3...5 . 10, 11...(19—30).

ENGLAND:—Oswestry! *Rev. T. Salwey*. Ulting near Maldon! *Mr. Piggott*. Yorkshire! *Mr. Dixon*. near Gainford, Durham. *Rev. J. Harriman*. Pontesford Hill! Shropshire.

IRELAND:—On trees and stones, frequent. *Mr. Carroll*.

Var. *tenella*, (Scop.) narrowly laciniate, *subcortically albo-maculate, effuse, crowded, ascending, tubuloso-inflated or fornicate at the apices, margins albo-fibrilloso-ciliate*.

On trees and stones. 1724.

SYN:—Scop. Carn. 1406. (1760.) Ach. Syn. 221. Nyl. Syn. 426.

FIG:—E. Bot. 1351.

EXS:—Schar. 352. Mudd 78. M. & N. 450. a. Hepp 879. Anzi It. S. 119. Bohl. 20.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1...3, 4, 5, 6...8...10, 11...14...19, 20...31.

ENGLAND:—Ulting near Maldon! *Mr. Piggott*. Twycross! Leicestershire. *Rev. A. Bloxam*, near Ayton! and Stokesley! Cleveland. *Mr. Mudd*. Holy Island, Northumberland. *Mr. Winch*. Ide. Devon. *Mr. Parfitt*. Kelvedon, Essex. *Mr. Verrane*. Midland Counties. *Mr. Purton*. Bedfordshire. *Rev. C. Abbot*. Cambridge. *Rev. R.*



*Relhan*. Oxford. *Dr. Sibthorp*. Haughmond Hill ! Llanymynech Hill ! Shropshire.

SCOTLAND :—On branches of trees. *Sir W. J. Hooker*. Swanston Wood ; Pentland Hills. *Dr. Greville*.

IRELAND :—Great Island, Cork ! Ballynagarde, Limerick ; *Mr. Carroll*.

WALES :—Llandrindod ! *Rev. T. Salwey*. Borth ! Cardiganshire.

CHANNEL ISLANDS :—Guernsey ! *Rev. T. Salwey*. Jersey. *Mr. Larbalestier*.

Var. *cæsia*, (Hffm.) whitish or albo-glaucous, or albo-cæsious, stellato-orbicular, multifido-laciniate, laciniae narrow, convex, contiguous, *subcortically albo-maculate, aspersed with cæsious or albo-cæsious pulvinate soredia*.

On trees &c. 1793.

SYN :—Hffm. Enum. 65, (1784.) Ach. Syn. 216. Nyl. Syn. 426.

FIG :—E. Bot. 1052. Hffm. En. t. 12. f. 1. Pl. L. t. 8. f. 1.

EXS :—Anzi It. S. 121. Schær. 348. 347. M. & N. 447. Anzi Langob. 312. Leight. 323.

GEOG. DISTRIB :—Europe, N. America.

BOT. PROV :—1...3, 4, 5...7...11...14, 15, 16. (19...30)...31.

ENGLAND :—Burgh and Bradwell, Suffolk ; and Acle, Norfolk. *Mr. Turner*. Richmond House, Richmond Park. *Mr. Sowerby*. Penzance ! *Rev. T. Salwey*. Gainford ; Fawdon Slate, Durham ; West Dipton near Hexham, Northumberland. *Mr. Winch*. Malvern Hills. *Dr. Holl*. Exeter. *Mr. Parfitt*. Pophills, Warwickshire. *Rev. W. S. Rufford*. Church Stretton ! Shropshire.

SCOTLAND :—King's Park, Edinburgh. *Dr. Greville*. Craig Tulloch ; Appin. *Rev. J. M. Crombie*.

IRELAND :—On rocks, frequent. *Mr. Carroll*.

WALES :—Aberdovey ! *Rev. A. Bloxam*.

CHANNEL ISLANDS :—Guernsey ! *Rev. T. Salwey*. Jersey, &c. *Mr. Larbalestier*.

11. *P. erosa*, Borr. greyish or glaucous white, crowded, imbricate, rotundo-abbreviato-laciniate, minutely-albo-granulate, margins of laciniae minutely jagged or crenulate, frequently ascending and granulate ; apothecia fuscous-black, margin sub-entire ; spores 8, fuscous, oblong, 1-septate.

On trees, walls, &c. 1837. rare.

The surface of the thallus is minutely albo-granulate not subcortically albo-maculate as in *P. stellaris* and its varieties.

SYN :—E. Bot. Suppl. 2807. (1837.) *tribacia* (in part) Ach. Syn. 191. Nyl. Syn. 425.

FIG :—E. Bot. Suppl. 2807.

EXS :—Larb. 24. Arn. 272. Leight. 266.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2...5...7...10...15, 16...19...31.

ENGLAND :—Hurstpierpoint, Sussex. *Mr. Borrer.* near Ayton, Cleveland. *Mr. Mudd.* Ludlow Castle, Shropshire. *Rev. T. Salwey.*

SCOTLAND :—Connel Ferry, Argyleshire. *Mr. Borrer.* Will's Braes ; Auldbar. *Mr. Gardiner.*

IRELAND :—Dargle. *Dr. Taylor.*

WALES :—Llanaber ! near Barmouth. *Rev. T. Salwey.*

CHANNEL ISLANDS :—Quenvais ; St. Ouen's Bay ! Jersey ! *Mr. Larbalestier.* Guernsey. *Rev. T. Salwey.*

12. *P. astroidea*, (Clem.) greyish-white, orbicular, thin, closely appressed, *almost entirely granulose or leprose*, laciniato-effigurate at the circumference ; apothecia fuscous-black, naked or pruinose ; spores 8, fuscous, elliptico-oblong, 1-septate, cells nucleolate.

On trees, rare. 1807.

SYN :—Clem. Ens. (add.) 302. (1807.) *P. Clementiana*, Ach. Syn. 204. Nyl. Syn. 426.

FIG :—E. Bot. 1779. Linn. Trans. t. 13. f. 1.

EXS :—Hepp 607. Schær. 610. M. & N. 737. Welw. Lusit. 104. Anzi Langob. 9.

GEOG. DISTRIB :—Europe, America.

BOT. PROV :—1, 2, 3, 4 ..7, 8...10...19...24...31.

ENGLAND :—Sussex ! ; Tunbridge Wells and Southampton. *Mr. Borrer.* Penzance ! *Rev. T. Salwey.* near Settle. *Dr. Windsor.* near Stokesley, Cleveland. *Mr. Mudd.* Kelvedon, Essex. *Mr. Varcane.* Twycross, Leicestershire ! West Haddon Northamptonshire. *Rev. A. Bloxam.*

IRELAND :—Tervoe near Limerick ! and Dinis, Killarney. *Mr. Carroll.* Dunkerron ; Blackwater Bridge, Kerry. *Dr. Taylor.*

WALES :—Barmouth ! *Rev. T. Salwey.*

CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.*

### *C. thallus fuscescent*, K—C—,

13. *P. aquila*, (Ach.) *castaneo-fuscescent*, opaque, sub-orbicular, appressed, narrowly laciniate, *laciniæ linearimultipartite*, plane or sub-convex, *stellate*, *imbricato-congested*, under surface pale, nigricanti-fibrillose ; apothecia adnate, fuscous-black, *margin sub-entire or crenulate* ; spores 8, fuscous, oblong, 1-septate. K—C—.

On maritime rocks chiefly. 1741.

SYN :—Ach. Prod. 109. (1798.) Syn. 205. Nyl. Syn. 422.

FIG :—E. Bot. 982. Hepp Sporen t. 69. f. 602.

EXS :—Schær. 565. Hepp 602. M. & N. 1049. Larb. 23. Anzi Langob. 10. Welw. Lusit. 70. Mass. 87. Bohl. 111. Leight. 144.

GEOG. DISTRIB :—Europe, Asia, N. America.

BOT. PROV :—1.. 5...7...14, 15...18...30, 31.

ENGLAND :—Cornwall. *Messrs. Turner & Sowerby.* Mynydd-y-

Myfyr. near Oswestry! *Rev. T. Salwey*. Torquay. *Dr. Deakin*. Devon and Cornwall. *Sir W. J. Hooker*. Heugh, Holy Island and on Fern Islands, Northumberland. *Mr. Winch*. Hartley Bates, Northumberland. *Mr. Thornhill*. Hudshead, Northumberland. *Dr. G. Johnston*. Lustleigh Cleve, Devon. *Mr. Parfitt*.

SCOTLAND :—Moncrieff Hill near Perth. *Dr. Lindsay*. near Montrose. *Dr. Maingay*. Aberfeldy. *Rev. H. Macmillan*. King's Park, Edinburgh. *Rev. J. Lightfoot*. Hermitage and Pentland Hills. *Mr. Maughan*. Twin Hill; Lundie Craigs. *Mr. Gardiner*. Stennis, Orkney. *Dr. Lindsay*. coast of Fife between Burntisland and Kirkcaldy; near Granton; Cramond Island. *Dr. Greville*.

IRELAND :—Near Ardglass co. Down. *Dr. Maingay*. on maritime rocks, common. *Mr. Carroll*.

WALES :—Anglesea. *Rev. H. Davies*. Aberdovey and near Beaumaris. *Rev. A. Bloxam*. Bangor! Barmouth!

CHANNEL ISLANDS :—Petit Port, Jersey! and all the Islands. *Mr. Larbalestier*. Guernsey. *Rev. T. Salwey*.

### TRIBE XIII. GYROPHOREI.

Characters the same as those of the only genus *Umbilicaria*.

#### I. UMBILICARIA, *Hoffm.*

Thallus membranaceous, monophyllous, umbilically affixed. Apothecia simply lecideine or patellaroid, complicato-compound or gyrose. Paraphyses distinct. Sterigmata articulate. Spermatia slender, shortly cylindrical, obtuse at both apices.

1. *U. pustulata*, Hoffm. thallus thin, torn, and lobed, papillose and naked on both sides; upper side pale olive-green, blistered and sprinkled with fibrous glomeruli; under side brownish, deeply pitted; spores one or two, very large, oblong, pale, wrinkled or reticulated on the surface; medulla K—C red.

On rocks and stones in mountainous districts, not uncommon. 1741.

SYN :—Hffm. Pl. L. 13. (1794.) *Gyrophora*, Ach. Syn. 66. Nyl. Lich. Scand. 113. Leight. Brit. Umbil. 22.

FIG :—Hffm. Pl. L. t. 28. f. 1. 2. E. Bot. 1283. Leight. Brit. Umbil. fig. 1.

EXS :—Bohl. 125. Schær. 156. Hepp 118. Breutel 201. Larbal. 25. Maudon 22. Anzi Langob. 297. M. & N. 60. Welw. Lusit. 21. 32. 107.

GEOG. DISTRIB :—Europe, Africa, N. America.

BOT. PROV :—1...5...7, 8, 9, 10...12. 16...19...22...31.

ENGLAND:—Malvern Hills. *Mr. Stokes*. near Biddiston Lighthouse, Cheshire. *Mr. Bradbury*. near Halifax. *Mr. Bolton*. Dartmoor! Devonshire (fruit). *Sir W. J. Hooker*. Hay Tor! on rocks in river near Two Bridges public house, Devon!; Dartmoor! *Mr. Borrer*. Blackstone Rock, Devon. *Mr. Parfitt*. Shaftoe Crags! *Sir W. C. Trevelyan*. Sugar Loaf Mountain, Monmouth. *Mr. Jacob*. Westmoreland. *Mr. Martindale*. Charnwood Forest, Leicestershire. *Rev. A. Bloxam*. Nesseliffe! Caer Caradoc! Shropshire.

SCOTLAND:—Highland Mountains. *Rev. J. Lightfoot*. Loch Sligachan! Isle of Skye. *Mr. Borrer*.

IRELAND:—Glengarriff near Bantry, (fruit). *Miss Hutchins*. Ireland. *Dr. Taylor*. Migen Head. *Mr. Wright*. Lough Dan co. Wicklow. *Adm. Jones*.

WALES:—By the road from Penmorvay to Dolbelmen, and under Keven Lees Castle, *Dillenius*. Old Wall, about half way between Caernarvon and Beddgelert. *Rev. H. Davies*. Nant Hevynant Vale near Snowdon. *Messrs Turner & Borrer*. Moel Hebog! *Mr. Borrer*. Cwm Bychan near Barmouth. *Rev. T. Salwey*.

CHANNEL ISLANDS:—Gorey and La Moye, Jersey! *Mr. Larbalestier*. near Petit Bo, Guernsey. *Mr. Lukis*.

2. *U. polyphylla*, (L.) dark greenish copper colour, thin, unequally lobed, naked and smooth on both surfaces, under surface black; apothecia slightly complicate; spores 8, colourless, ellipsoid, simple; medulla K—C faint red.

On mountainous rocks, not uncommon. 1741.

SYN:—Linn. Sp. Pl. ed. 1. No. 55. (1753.) Nyl. Scand. 119. Leight. Br. Umbil. 6.

FIG:—E. Bot. 1282. Hffm. Pl. t. 59. f. 2. Leight. Br. Umbil. f. 2.

GEOG. DISTRIB:—Europe, Asia, America.

BOT. PROV:—1 ..5 ..7, 8.. 10, 11, 12...14, 15...17...19.

Forma *monophylla*, T. & B. thallus of a single peltate leaf.

SYN:—T. & B. Lich. Brit. 214. (1813.) Leight. Br. Umbil. 6.

EXS:—Hepp 717. M. & N. 342. (in part) Schaer. 149, Leight. 65. Müll. 87.

ENGLAND:—Cheshire and Cornwall. *T. & B. Lich. Brit.* Yorkshire! *Mr. Dixon*. Ingleby and Howden Gill! Cleveland. *Mr. Müll.* near Todmorden and on Ingleborough. *Dr. Carrington*. near Newcastle. *Mr. Thornhill*. Mynydd-y-Myfyr near Oswestry. *Rev. T. Salway*. Abbey St. Bathans! Weardale! Blanchland and near Hunt Udd, Teedale. *Sir W. C. Trevelyan*. Cheviot; Hedgehope; Shaftoe and Bealby Crags near Wallington, Northumberland. *Mr. Winch.* E.ystone, Healey Field, and Conset Park, Hunter-Jay Peak between Westby Park and Hishope, Durham. *Mr. Thornhill*. Westmoreland; Crookley, Yorkshire. *Mr. Martindale*. Charnwood Forest, Leicestershire. *Rev. A. Bloxam*. Blackstone Rock, Devon. *Dr. Dickie*. Wrekin! Arcoll! Stiperstones Hills! Shropshire.



SCOTLAND :—Clova ! Craig Raynoch ! *Mr. Gardiner*. Ben Mac Dhui, Braemar ! Birnam Hill ; Craig-y-Barns ; Dunkeld ; Glen Dee. *Dr. Lindsay*. Aviemore ; Ben Nevis. *Adm. Jones*. Inchnadarnf, ! Sutherland. *Sir W. C. Trevelyan*. Braemar and Lochaber. *Rev. J. M. Crombie*.

IRELAND :—Luggelaw. *Adm. Jones*.

WALES :—Cellfawr near Barmouth ! *Rev. T. Salwey*. Llyn Llydaw ; Llyn Cwm y Ffynnon las ; Cwm Brwynog near Llanberis. *Dillenius*. Glyder Vach !

*Forma congregata*, T. & B. thallus small, clustered, much curled, edges erect or reflexed.

SYN :—T. & B. Lich. Brit. 214. (1813.) Leight. Br. Umbil. 7.

EXS :—Anzi It. S. 79.

ENGLAND :—Mynydd-y-Myfyr near Oswestry, ! *Rev. T. Salwey*. Battersby Moor ! Cleveland. *Mr. Mudd*. Ramshaw Rocks ! near Warslow, Staffordshire. *Rev. A. Bloxam*. Maze Beck ! Westmoreland. *Mr. Robertson*. Wrekin ! Arcoll ! Hills, Shropshire.

The states *monophylla* and *congregata* grow together in some abundance on the Wrekin and adjoining hills, and may be seen passing into each other by every degree of gradation.

*Forma sulcata*, T. & B. upper surface of thallus marked with superficial cracks.

SYN :—T. & B. Lich. Brit. 214. (1813.) Leight. Br. Umbil. 7.

SCOTLAND :—On Ben Ferg !, by Loch Erich, Invernessshire. *Mr. Borrer*. Clova ! *Mr. G. Lawson*.

“Thallus somewhat thicker than in f. *monophylla*, simple or more or less compound ; upper surface marked with a few superficial, undulating, indented lines, the edges of which occasionally separate so as to leave a smooth black interstice ; under surface as in *monophylla* but more commonly blotched with the paler colour of the upper side.”  
—*Lich. Brit.*

This state seems apparently a transition to *hyperborea*.

*Forma lacera*, Leight. thallus very deeply divided, divisions lacero-lobate.

SYN :—Leight. Br. Umbil. 8. Mudd Man. 116.

EXS :—Hepp 718.

SCOTLAND :—Craig Raynoch ! *Mr. Gardiner*. Scotland ; *Mr. G. Lawson*. Grampians. *Rev. J. M. Crombie*.

The mode of division of the margins of this state is different from that of the preceding ones, and assimilates to that observable in *anthracina*.

3. *U. flocculosa*, (Wulf.) greenish copper-colour, simple or clustered or squamigerous, thin, unequally lobed, edges sometimes ragged and crose, upper surface dotted and rough with sooty granulations, under surface black, naked



pitted ; apothecia slightly complicate ; spores 8, colourless, oblongo-ellipsoid, simple ; medulla K—C red.

On mountainous rocks, not uncommon. 1785.

SYN :—Wulf. in Jacq. Coll. 3. 99. (1789.) T. & B. Lich. Brit. 217. Leight. Br. Umbil. 8. Nyl. Scand. 119.

FIG :—E. Bot. 2483. Hfm. Pl. L. t. 68. f. 1—4. Leight. Br. Umbil. fig. 4.

EXS :—Anzi Langob. 60. It. S. 81. Schaer. 152. Hepp 115. M. & N. 443. Leight. 219.

GEOG. DISTRIB :—Europe.

BOT. PROV :—5...8...10, 11 ..14, 15, 16.

ENGLAND :—Northern Counties ! Eglestone, Durham. *Rev. J. Harriman*. Whitwick Rocks ! Leicestershire *Rev. A. Bloxam*. Yorkshire. *Mr. Dixon*. Caer Caradoc ! Shropshire.

SCOTLAND :—Highlands. *Mr. Dickson*. Corstophine and Craiglockart Hills. *Dr. Greville*. Ben Nevis ! Ben Cruachan ! *Mr. Borrer*. Appin. *Rev. J. M. Crombie*.

4. *U. hyperborea*, (Ach.) dark greenish-brown, thin, jagged, and somewhat lobed, slightly perforated, naked on both sides, *upper surface rugoso-pustulate*, under surface blackish-brown, nearly smooth, *slightly lacunose* ; apothecia complicate ; spores 8, colourless, ellipsoid, simple ; medulla K—C red.

On alpine rocks, very rare. 1790.

SYN :—Ach. Kongl. Vet. Acad. N. H. 15. p. 89. (1794.) Syn. 66. Nyl. Lich. Scand. 118. Leight. Br. Umbil. 10.

FIG :—Hfm. Pl. L. t. 71. Leight. Br. Umbil. fig. 5. and 5. a.

EXS :—Schaer. 150. 151. Hepp 116. Fellm. 90. M. & N. 1047. Anzi It. S. 78. Fr. 126.

GEOG. DISTRIB :—Europe, America.

BOT. PROV :—9...15...19.

ENGLAND :—Clougha, Lancashire. *Mr. Jacob*.

SCOTLAND :—Scotch Mountains ! *Mr. Dickson in herb. Borrer*. By the Truim, near Dalwhinnie, Invernessshire. *Mr. Brodie*. Invercauld. *Adm. Jones*. Ben Nevis ; Lochaber ; Morchone ; Ben Mac Dui, Braemar. *Mr. Mudd*.

IRELAND :—Brandon Mountains, Kerry. *Dr. Moore*.

*Mr. Borrer* sought for the plant in vain in the particular station specified by *Mr. Brodie*.

In my own herbarium is a specimen received from *Mr. George Dixon*, of Great Ayton, Yorkshire, given to him by a friend who collected it somewhere in Scotland ; but I could not ascertain the exact locality by subsequent correspondence.

5. *U. arctica*, (Ach.) dark greenish-brown, thickish, slightly lobed, crenate, naked, upper surface granulato-corrugate, under surface pallescent, minutely depresso-

granulate ; apothecia complicate ; spores 8, colourless, ellipsoid, simple ; medulla K—C red.

On alpine rocks, very rare. 1798.

SYN :—Ach. Meth. 106. (1803.) Syn. 65. Nyl. Lich. Scand. 116. Leight. Brit. Umbil. 11.

FIG :—E. Bot. 2485. Ach. Meth. t. 2. f. 6. Leight. Br. Umb. f. 6.

EXS :—Schær. 556. Th. M. Fr. 65. Fellm. 91. Breutel 112.

GEOG. DISTRIB :—Europe, N. America.

BOT. PROV :—1...11...15.

ENGLAND :—Devonshire? *Hudson Herb.* rocks in co. Durham ! *Mr. Robson in herb. Borrer.*

SCOTLAND :—Lochnagar. *Dr. Lindsay.* Ben More in Breadalbane ; Morrone in Braemar. *Rev. J. M. Crombie.*

6. *U. erosa*, (Web.) greenish brown, thickish, splitting when old into 2 or 3 laminæ, jagged and somewhat lobed, perforated, upper surface naked, divided by flexuose anastomosing black indented lines, with convex areolæ, under side paler, coarsely papillose, separately perforated, laciniato-fibrillose ; apothecia complicate ; spores 8, colourless, ellipsoid, simple ; medulla K—C red.

On alpine rocks, frequent. 1741.

In all our British specimens the reaction is medulla K—C red ; but in Fellm. 92. and specimens from Dr. Nylander and Dr. T. M. Fries the reaction is medulla K yellow C—.

SYN :—Web. Spicil. 259. (1778.) Ach. Syn. 65. Nyl. Lich. Scand. 118. Leight. Br. Umbil. 12.

FIG :—E. Bot. 2066. Hffm. Pl. L. t. 70. Leight. Br. Umbil. fig. 7.

EXS :—Tuck. 48. M. & N. 250. Schær. 153. Bohl. 19.

GEOG. DISTRIB :—Europe, America.

BOT. PROV :—1...5...7...10, 11...15 ..19 ..23.. 26.

ENGLAND :—St. Vincents Rocks near Bristol. *Mr. Hudson.* Durham ; Yorkshire. *Sir J. E. Smith.* Birkdale, Westmoreland ! *Mr. Robertson.* Dartmoor ! *Mr. Borrer.* Swinhope Fell, Durham ! *Mr. Mudd.* Stansfield Moor near Halifax. *Mr. Brunton.* Huntersley Peak, north west of Waskerley Park ; Blackburn near Eglestone, Durham ; Cronkley Fell ; Cheviot and Hedgehope, Northumberland. *Mr. Winch.*

SCOTLAND :—Highlands. *Rev. J. Lightfoot.* Vitrified forts in the Highlands. *Sir. J. E. Smith.* Corry Leese, Ben Nevis ! *Mr. Borrer.* Ben Beek ! Craig Koynock ! *Mr. Gardiner.* Clova ! *Mr. Lawson.* Aviemore. *Adm. Jones.* Lochnagar. *Dr. Lindsay.* Ben Lawers. *Dr. Maingay.* Inchnadamff ! *Sir W. C. Trevelyan.* Braemar. *Rev. J. M. Crombie.*

IRELAND :—Mangerton and other Mountains. *Dr. Taylor.* Slieveleor, Mayo. *Dr. Moore.* Luggelaw. *Adm. Jones.*

WALES :—Llanberis. *Rev. Hugh Davies.* North Wales. *Sir J. E.*

*Smith.* Capel Curig! *Mr. H. Piggot.* Cellfawr near Barmouth. *Rev. T. Salwey.*

7. *U. polyrrhiza*, (L.) greenish copper-colour, smooth, thin, unequally lobed and crenate, under surface black, papilloso-granulate, reticulated and densely fibrous; apothecia gyroso-complicate; spores 8, colourless, elliptico-oblong, simple; medulla K—C red.

On alpine rocks, frequent.

SYN:—Linn. Sp. Pl. ed. 1. No. 56. (1753.) Nyl. Scand. 120. *G. pellita*, Ach. Syn. 67. Leight. Br. Umbil. 14.

FIG:—E. Bot. 931. Hffm. Pl. L. t. 26. f. 3. Leight. Br. Umbil. fig. 11.

Exs:—M. & N. 343. Mudd 89.

GEOG. DISTRIB:—Europe, Asia.

BOT. PROV:—1...7.. 9, 10, 11, 12...15...22.

ENGLAND:—Yorkshire. *Mr. Brunton.* Durham. *Rev. J. Harri-man.* Cheshire. *Messrs Turner & Borrer.* Cronkley. *Mr. Robertson.* near Lake Tumanel! Cumberland. *Mrs. Stanger.* Baysdale Moor; Highcliff; Ayton Moor! Cleveland. *Mr. Mudd.* Shaftoe Crags, Hedgehope, Cheviot, and Hexham Fell, Northumberland; Muggle-wick Fell, Cronkley Fell, Durham. *Mr. Winch.* Dartmoor. *Dr. Holl.*

SCOTLAND:—Highlands and Lowlands. *Rev. J. Lightfoot.* Clarlis Park and Paradise near Moneymusk, Aberdeenshire. *Withering.* Loch Phadrick! Craig Koynoch! Clova. *Mr. Gardiner.* Ben Ferrog! Llyn Canvay! *Mr. Borrer.* Clova! *Mr. Lawson.* Callernish, Lewis; Birnham Hill, Dunkeld; Lochnagar; between Percy and Spittal of Glenshee; Amulree. *Dr. Lindsay.* Penmanshiel! *Sir W. C. Trevel-yan.* Glen Callater and Glen Dee in Braemar. *Rev. J. M. Crombie.*

IRELAND:—Tonlague co. Wicklow. *Dr. Taylor.*

WALES:—Llyn Llydaw, Snowdon; Llyn Cwm y Ffynnonlas; Cwm Brwynog towards Ardu near Llanberris. *Dillenius.* Carnedd Llewellyn; Moel Siabod; *Mr. Griffith.* Cwm Bychan, Barmouth! *Rev. T. Salwey.*

8. *U. grisea*, (Sw.) ashy-grey or mouse-coloured, thin, somewhat lobed, crenate, minutely areolato-papillate, under surface blackish, naked, minutely granulato-areolate or scabrid, granules pale as if rubbed; apothecia gyrose; spores 8, colourless, ellipsoid, simple; medulla K—C red.

On alpine rocks, very rare. 1866.

SYN:—Swartz in Westr. Forsch. &c. 52. (1723.) Leight. Br. Umbil. 16. *G. murina*, Ach. Syn. 69. Nyl. Scand. 116.

FIG:—E. Bot. 2486. Chev. Paris. t. 14. f. 11. c. Leight. Br. Umbil. f. 14.

Exs:—M. & N. 736. Nyl. 130.

GEOG. DISTRIB:—Europe,

BOT. PROV:—31.

CHANNEL ISLANDS :—Beauport ! East coast of Jersey ! *Mr. Laroche*.

9. *U. proboscidea*, (Ach.) cinereo-nigrescent, thin, crenate, slightly lobed, pale pruinose, grey in the centre where it is marked with elevated reticulated veins, the other portion rugose, under surface smooth, cinereopalescent ; apothecia gyroso-plicate ; spores 8, colourless, ellipsoid, simple ; medulla K—C red.

On alpine rocks, frequent. 1741.

SYN :—Ach. Prod. 147. (1798.) Syn. 64. Nyl. Scand. 116. *deusta*, Leight. Br. Umbil. 17. 18. 19.

FIG :—E. Bot. 2484. Leight. Br. Umbil. fig. 15.

EXS :—Schær. 148. Anzi It. S. 77. Fr. 128. Tuck. 49.

GEOG. DISTRIB :—Europe, Asia, America.

BOT. PROV :—1...5...7...11...15...19...22.

ENGLAND :—St. Vincents Rocks. *Mr. Darc.* North of England. *Sir J. E. Smith.* Summit of Hedgehope ! Northumberland ; *Dr. G. Johnston.* Cheviot ; Shaftoe Crags, near Wallington, Northumberland ; High Force and Cronkley Fell, Teesdale, Harewood, Widdy Bank and Cauldron Snout, Durham. *Mr. Winch.* Blackstone Rock, Devon. *Dr. Ralfs.* Swinhope Fell, Durham. *Rev. J. M. Crombie.*

SCOTLAND :—Highland Rocks. *Rev. J. Lightfoot.* Ben Lawers ! *Mr. Borrer.* Lochnagar ! Hills east of Glen Callater ! Ben Nevis ! *Dr. Lindsay.*

IRELAND :—Brandon co. Kerry. *Miss Hutchins.*

WALES :—Rocks. *Sir J. E. Smith.*

forma *fimbriata*, T. & B. thallus edged with a few black branched tooth-like fibres ; medulla K—C red.

On alpine rocks.

SYN :—Turn. and Borr. Lich. Brit. 222. (1839:) Leight. Br. Umbil. 18.

EXS :—M. & N. 249.

ENGLAND :—Swinhope Fell ! Durham. *Mr. Mudd.*

SCOTLAND :—Highlands ! *Mr. Borrer.* between Glen Callater and Lochnagar ! *Mr. Tatham.* Clova ! Loch Phadrick ! *Mr. Gardiner.* Inchnadamff ! *Sir W. C. Trevelyan.*

IRELAND :—Glenmalure ! co. Wicklow. *Mr. Carroll.*

Similar in substance, colour, and every other respect except in having the edges of the thallus here and there toothed and fringed with a few scattered black branching fibres. There are also occasionally a few fibres sprinkled over the underside.

Forma *corrugata*, (Hoffm.) thallus thin, rough with elevated reticulations ; medulla K—C red.

On alpine rocks.



SYN:—Hoffm. Pl. Lich. 65. (1794.) T. & B. Lich. Brit. 222. Leight. Br. Umbil. 18.

FIG:—Hoffm. Pl. L. t. 43. f. 4. 7.

SCOTLAND:—Highlands! *Mr. Borrer*.

Similar in all respects, except in its upper surface having extremely prominent reticulations, rising to nearly a line in height, and looking like a series of erect curled squamæ,

forma *mesenteriformis*, (Wulf.) thallus thickish, under surface rough with elevated reticulations and somewhat papillose; medulla K—C red.

On alpine rocks.

SYN:—Wulfen in Jacq. Misc. 2. 85. (1781.) T. & B. Lich. Brit. 222. Leight. Br. Umbil. 19.

FIG:—Jacq. Misc. t. 9. f. 5.

EXS:—Schær. 147.

SCOTLAND:—Highlands! *Mr. Borrer*.

Upper surface of the thallus singularly rugose, almost papillose. The reticulations nearly as prominent as in *f. corrugata*, and sometimes growing out into new leaves: substance considerably thicker than in the other states.

10. *U. cylindrica*, (L.) dull greenish brown, or cinerascens, thickish, unequally lobed, margins *nigro-fibriloso-ciliate*, upper surface *rugulose*, under surface *pallidescens*, more or less fibrillose; apothecia *concentrico-gyrose*, podicellate; spores 8, colourless, ellipsoid, simple; medulla K—C—.

On alpine rocks, frequent.

SYN:—Linn. Sp. Pl. ed. 1. No. 29. (1753.) Ach. Syn. 65. Nyl. Scand. 117. *proboscidea*, Leight. Br. Umbil. 19.

FIG:—E. Bot. 522. (two upper fig.) Hoffm. Pl. L. t. 44. f. 1—6. Leight. Br. Umbil. fig. 16. 17. 18.

EXS:—Schær. 143. 146. Mudd 88. Zw. 206. Hepp 719. in part. Anzi It. S. 74. M. & N. 59. Breutel 113.

GEOG. DISTRIB:—Europe, America, N. Holland.

BOT. PROY:—1...7...10, 11, 12...15, 16...18, 19...25, 26.

ENGLAND:—Dartmoor. *Mr. Newberry*, North of England. *Sir J. E. Smith*. Cheviots. *Mr. Winch*. Summit of Hedgehope, Northumberland. *Dr. G. Johnston*. Birkdale! Westmoreland. *Mr. Robertson*. Scawfell! *Mrs. Stanger*. Yorkshire! *Mr. Dixon*. Falcon Clints! Teesdale. *Mr. Mudd*. Fairfield, Westmoreland. *Mr. Martindale*.

SCOTLAND:—Goatfield, Isle of Arran; Braedalbane; Ben Nevis. *Rev. J. Lightfoot*. Loch Phadrick! Strome-dhu! Summit of Carlwrie! *Mr. Gardiner*. Clova! *Mr. Lawson*. Morehone! Ben Mac Dhui! *Dr. Lindsay*, Long Island. *Prof. Balfour*.

IRELAND:—Connavalla. *Dr. Whitley Stokes*. Mangerton, *Dr. Taylor*, on mountain rocks, frequent. *Mr. Carroll*.



WALES :—Llyn Llydaw ! Llyn Cwm y Ffynuontas ; Cwm Brwynog near Llanberis ; Berwyns, *Dillenius*. Carned Llewellyn. *Mr. Griffiths*. Arran Mowddly ! *Mr. Borrer*. Cwm Bychan. *Rev. T. Salwey*. Snowdon, Llanberis ascent !

forma *denticulata*, (Ach.) margins of thallus coarsely fringed and toothed ; medulla K—C—.

On alpine rocks.

SYN :—Ach. Meth. 107. (1803.) Leight. Br. Umbil. 21.

FIG :—E. Bot. 522. (two lower fig.) Dill. t. 29. f. 116. B.

EXS :—Schær. 144.

SCOTLAND :—Loch Phadrick ! Ben-na-Bourd ! *Mr. Gardiner*. Clova ! *Mr. Lawson*.

IRELAND :—Galtymore ! co. Tipperary. *Mr. Carroll*.

WALES :—Arran Mowddly ! *Mr. Borrer*.

In all respects similar, except that the marginal fibres are coarser and larger, and more evidently a prolongation of the thallus.

Forma *denudata*, T. & B. margins of thallus almost naked ; medulla K—C—.

On alpine rocks.

SYN :—Turn. and Borr. Lich. Brit. 219. (1813.) Leight. Br. Umbil. 21.

FIG :—Hffm. Pl. L. t. 44. f. 7.

EXS :—Schær. 145.

ENGLAND :—Falcon Clints ! Westmoreland Mountains ! *Mr. Borrer*.

SCOTLAND :—Highlands. *Messrs Turner & Borrer*.

WALES :—Summit of Glyders ! *Mr. Borrer*.

Forma *exasperata*, T. & B. thallus polyphyllous, ragged, upper surface rugose, margins undulate and crisped ; medulla K—C—.

On alpine rocks.

SYN :—Turn. & Borr. Lich. Brit. 219. (1813.) Leight. Br. Umbil. 22.

ENGLAND :—Durham. *Mr. Robson*.

SCOTLAND :—Clova ! *Mr. G. Lawson*.

Remarkably curled and undulated, and divided into numerous small irregular laciniae : upper surface remarkably rough.

## SERIES V. PLACODEI.

Thallus crustaceous, squamose, radiate, granulose, powdery or evanescent. Apothecia lecanorine or leci-deine, or biatorine or lirelliform.

## TRIBE XIV. LECANOREI.

Thallus various. . Apothecia lecanorine or sub-lecanorine or pseudo-biatorine.

## SUB-TRIBE I. PSOROMEL.

Thallus variously squamulose, in texture conspicuously cellulose, gonidia distinct large. Apothecia lecanorine. Spores 8, colourless, large and simple. Paraphyses distinct. Spermogonia with arthrosterigmata.

I. PSOROMA, *Fr. pr. p. Nyl.*

Thallus variously squamulose, cellulose, gonidia distinct large. Apothecia lecanorine, margin crenate. Spores 8, colourless, large ellipsoid, simple. Paraphyses distinct. Sterigmata pluri-articulate.

1. *P. hypnorum*, (Vahl.) *flavido-fuscescent* or *brownish-yellow*, *squamuloso-granulate*, squamulae crenate or subgranulose; apothecia *rufous* or *fuscescent*, moderately large, *margin elevated granuloso-crenate*; spores 8, colourless, ellipsoid, apices rather acute, sub-crenulate.

On mosses or earth, not common. 1793.

SYN.—Vahl. in Fl. Dan. 6. t. 956. (1787.) Ach. Syn. 193. Nyl. Scand. 121.

SYN.—E. Bot. 740. Hffm. Pl. L. t. 63. f. 4—7.

EXS.—Schær. 546. Tuck. 20. Fr. 162. 339. Anzi Langob. 64, & 65. Larbal. 70.

GEOG. DISTRIB.—Europe, America.

BOT. PROV.—2, 3, 4, 5...11, 12, 13, 14, 15...19...30, 31.

ENGLAND:—Ludlow, Shropshire. *Dr. Babington*. Yarmouth. *Mr. Turner*. Castleton!, Cumberland. *Mrs. Stanger*. Oswestry, Shropshire! *Rev. T. Salwey*. Eglestone, Durham. *Rev. J. Harriman*. near Brighton, Sussex. *Mr. Hemmings*. Hay Crag Wood; Eglestone and Middleton; Teesdale Forest, Durham; Gunnerston Crag near Barwesford; Shewing Shields; Cheviot, Northumberland. *Mr. Winch*. Shoreham, Sussex. *Mr. Larbalestier*. Malvern, *Dr. Holl*. Cowley Bridge road, Exeter. *Mr. Parfitt*.

SCOTLAND:—Rosslyn Wood. *Mr. Maughan*. Pentland Hills. *Dr. Greville*. Glen Dole, Clova, *Mr. Gardiner*. Beld Craig, Moffat. *Dr. Nichol*. Killin; Ben Lawers. *Dr. Holl*. Var. *deaurata*, Ach. (thallo magis flavescente et apotheciis majoribus) near Corriemulzie in Braemar. *Rev. J. M. Crombie*.

IRELAND:—Near Belfast. *Mr. Templeton*. near Killarney. *Dr. Taylor*. near Carnlough co. Antrim. *Adm. Jones*.

CHANNEL ISLANDS:—Grosnez, Jersey; Eperquerio, Sark. *Mr. Larbalestier*.

## SUB-TRIBE II. PANNARIEI.

Thallus laciniato-radiate or squamulose or granulose, cellulose, with granula gonima. Apothecia lecanorine

or biatorine. Spores 8, colourless, ellipsoid, simple or 1-septate. Sterigmata pluri-articulate.

## II. PANNARIA. *Del.*

Characters as above.

### A. Spores simple.

1. *P. rubiginosa*, (Thunb.) *livido-glaucous* or pale, lacinate, laciniae appressed, nearly plane, inciso-lobulate and crenate, upper surface very minutely areolato-granulate, edges somewhat thickened, silvery whitish and upturned, under surface tomentose cæruleo-fuscescent; apothecia rufous, margin crenulate; spores 8, colourless, ellipsoid, apices rather acute, simple.

On mossy rocks and trees. 1801.

SYN:—Thunberg Fl. Cap. 176. (1794.) Ach. Syn 202. Nyl. Scand. 122.

FIG:—E. Bot. 983. Hepp Sporen t. 69. f. 606.

EXS:—Schær. 563. Hepp 606. Welw. Lusit. 78. 123. Maudon 15. Leight. 234.

GEOG. DISTRIB:—Europe, America.

BOT. PROV:—1, 2 . 5...7...10, 11, 12, 13...15 . 19...31.

ENGLAND:—Keswick, Cumberland. *Mrs. Stanger*. Teesdale, Durham. *Rev. J. Harriman*. near Settle, Yorkshire. *Dr. Windsor*. Hay Coppice, Herefordshire. *Rev. T. Salwey*. Charnberry and Eglestone Woods, Durham. *Mr. Winch*. S. Devon. *Dr. Holl*. Appuldercombe, Isle of Wight. *Rev. A. Bloxam*.

SCOTLAND:—Aberfeldy. *Dr. Maingay*. Drumlanrig Wood, Dumfries. *Mr. Stevens*. Glen Dole, Clova. *Mr. Gardiner*. Killin. *Dr. Holl*. S.W. Grampians, head of Loch Awe. *Rev. J. M. Crombie*.

IRELAND:—Killarney. *Dr. Carrington*. frequent in the mountainous districts. *Mr. Carroll*.

WALES:—Barmouth! Valley above Halfway house; and above Borthwnog. *Rev. T. Salwey*.

CHANNEL ISLANDS:—Jerbourn, Guernsey. *Mr. Larbalestier*.

Var. *cæruleo-badia* (Schær.) centre of thallus and margins *cæsio-pulverulento-sorediose*.

On trees.

SYN:—Schleicher Cent. 2. 71. (1805.) *P. conopsea*, Ach. Syn. 43. Nyl. Scand. 122.

FIG:—Mass. Ric. fig. 219.

EXS:—Schær. 369. Hepp 607. Zw. 253. Anzi It. S. 151. M. & N. 310.

GEOG. DISTRIB:—Europe.

BOT. PROV:—5...7. :12.. 15...(19—30)...31.

ENGLAND :—Keswick, Cumberland. *Mrs. Stanger*. Oswestry, Shropshire! *Rev. T. Salwey*.

SCOTLAND :—Trossachs. *Rev. J. M. Crombie*.

IRELAND :—On rocks not unfrequent. *Mr. Carroll*.

WALES :—Valley above Halfway house ; and above Borthwnog near Barmouth. *Rev. T. Salwey*. Dolgelley. !

CHANNEL ISLANDS :—Jerbourg, Guernsey ; Rozel, Jersey. *Mr. Larbalestier*.

2. *P. elvina*, (Whlnb.) *umbrino-olivaceous*, membranaceous, *stellato-orbicular*, *sub-crustaceo-leproso-granulate* in the centre, *laciniae* imbricate, *closely appressed*, narrow, linear, *plicato-radiate*, contiguous, plane, smooth, *with a few scattered pale soredia* towards the subtruncate apices *divided and crenato-lobate* ; apothecia small, umbrino-olivaceous, margin entire, spores 8, colourless, ellipsoid, simple, small.

On trees and walls, rare. 1810.

SYN :—Wahlenberg in Ach. Meth. Suppl. 54. (1803.) Nyl. Syn. 200. Nyl. Scand. 123.

FIG :—Wahl. Fl. Lapp. t. 28. f. 3. E. Bot. 2158.

EXS :—Mass. 245. Anzi It. S. 129.

GEOG. DISTRIB :—Italy, Finmark.

BOT. PROV :—2...4.

ENGLAND :—Norwich. *Sir J. E. Smith*. Sussex. *Mr. Borrer*.

3. *P. leucolepis*, (Whlnb.) *albo-or livido-cinerascent*, squamulose, squamulae imbricate *verrucoso-areolate* in the centre, thoseto wards the circumference *appressed*, *radiato-lobate*, dilated, sub-crenate, slightly *longitudinally striated* ; apothecia black, plane, margin tumid, *crenulate* ; spores 8, colourless, ellipsoid, simple.

On micaceous rocks, rare. 1811.

SYN :—Wahl. Fl. Lapp. 420. Ach. Syn. 194. Nyl. Scand. 123.

FIG :—E. Bot. 2283.

EXS :—Leight. 267. Anzi Langob. 27.

GEOG. DISTRIB :—Europe.

BOT. PROV :—15.

SCOTLAND :—Ben Lawers ! and Mael Greadha. *Mr. Borrer*. Messrs. Macmillan ! Carroll ! and Jones. Breadalbane Mountains. Messrs. Borrer & Hooker.

4. *P. pezizoides*, (Web.) *brown*, *cervine* or *cinereo-fuscescent*, *granulato-squamulose*, densely imbricate, squamulae small crenate ; apothecia *testaceo-rufous* or *rufo-fuscescent*, *margin crenulate* ; spores 8, colourless, ellipsoid, simple.

On the earth amongst moss and on rocks, frequent.

SYN:—Web. Spicil. 200. (1778.) *brunnea*, Ach. Syn, 193. Nyl. Scand. 123.

FIG:—E. Bot. Suppl. 2801.

EXS:—Fellm. 96. Schær. 160. M. & N. 639. Mass. 315. Mudd 90. Anzi It. S. 152. Fries 256.

GEOG. DISTRIB:—Europe.

BOT. PROV:—2, 3...7...10.. 12...15 ..19...31.

ENGLAND:—Holwick Scar, Yorkshire. *Mr. Robertson*. Cumberland! *Mrs. Stanger*. near Battersby!; Baysdale!; Cleveland. *Mr Mudd*. Heavitree, Exeter. *Mr. Parfitt*. near Bonchurch, Isle of Wight. *Rev. A. Bloxam*.

SCOTLAND:—Kenmore; Ben Lawers. *Dr. Holl*.

IRELAND:—Bantry. *Miss Hutchins*. Cromaglan. *Dr. Carrington*.

WALES:—Cwm Bychan near Barmouth! *Rev. T. Salwey*. Tygwyn, Dolgelley. *Dr. Holl*.

CHANNEL ISLANDS:—Guernsey. *Rev. T. Salwey*.

Var. *coronata*, (Ach.) *cæruleo-cinerascent*, minutely *granuloso-sub-pulverulent*; apothecia small, reddish-brown, *margin granulose*.

On the earth in mossy shady places, frequent. 1796.

SYN:—Ach. Syn. 194. (1817.) Nyl. Scand. 124.

FIG:—E. Bot. 1246.

EXS:—Larbal. 26. Leight. 235. Anzi It. S. 153.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1...5 ..7...11, 12, 13, 14, 15.. 19...31.

ENGLAND:—Near High Hesket, Cumberland. *Mrs. Stanger*. Shropshire. *Rev. E. Williams*. South bank of the Derwent above Blanchland, Northumberland; Howns Wood near Lanchester and in Teesdale Forest, Durham. *Mr. Winch*. Malvern; S. Devon and Cornwall. *Dr. Holl*. Budleigh Salterton, Devon. *Dr. Dickie*.

SCOTLAND:—Dumfriesshire. *Dr. Burgess*. near Stirling. *Dr. Buchanan*. Pentland Hills. *Mr. Maughan*. Colinton. *Dr. Greville*. Killin. *Dr. Holl*. Grampians. *Rev. J. M. Crombie*.

IRELAND:—Killarney. *Dr. Carrington*. frequent in subalpine situations. *Mr. Carroll*.

WALES:—Bangor. *Mr. Turner*. Barmouth.!

CHANNEL ISLANDS:—Guernsey. *Rev. T. Salwey*. Jersey. *Mr. Larbalestier*.

5. *P. microphylla*, (Sw.) *cervine* or *livido-cinerascent*, *squamuloso-crustaceous*, *areolato-diffract*, *squamulæ* minute, crenate, closely imbricate, *whitish at the edges*, under surface *nigricant*; apothecia *fuscous* or *rufescent*, convex, *pale within*, *margin ultimately obliterated*; spores 8, colourless, ellipsoid, simple.

On trees and rocks, very rare. 1799.



SYN:—Swartz in V. Ac. II. 301. (1791.) Ach. Syn. 53. Nyl. Scand. 124.

FIG:—E. Bot. 1247.

EXS:—Zw. 388. Anzi It. S. 150, Schær. 161. Hepp 608. Larbal. 71.

GEOG. DISTRIB:—Europe, Asia, Africa, N. America,

BOT. PROV:—1.. 4...19...31.

ENGLAND:—Cornwall; Yarmouth. *Mr. Turner.*

IRELAND:—Killarney. *Dr. Moore.*

CHANNEL ISLANDS:—Jerbourg, Guernsey; Rozel Tower, Jersey; L'Eperquerie, Sark! *Mr. Larbalestier.*

6. *P. triptophylla*, (Ach.) *fusco-cinerascent*, *squamulose*, *orbicular* or *irregular*, *squamulae membranaceous*, *laciniato-lobate*, *crenate*, *appressed* or *microlepideo-granulose* or *coralloideo-squamulose*, *compact*, *areolato-diffract*, *hypothallus caeruleo-nigricant*; *apothecia fuscous* or *rufo-fuscescent*, *hypothecium fusco-nigricant*, *margin pale*, *persistent*; *spores 8*, *colourless*, *ellipsoid*, *simple*; *gelatina hymenea blue* with *iodine*.

On trees, rare. 1799.

SYN:—Ach. L. U. 215. (1810.) Syn. 53. Nyl. Scand. 125.

FIG:—E. Bot. 2128. Schrad. t. 1. f. 4.

EXS:—Fellm. 98. 99. Schær. 159. Hepp 610. M. & N. 552.

GEOG. DISTRIB:—Europe, N. America.

BOT. PROV:—1, 2...5, 7...15, 16, 17...19...30.

ENGLAND:—Bodmin. *Mr. Turner.* Sussex. *Mr. Hemmings.* Pentregaer near Oswestry! *Rev. T. Salwey.* near Lidford, S. Devon. *Dr. Holl.*

SCOTLAND:—Loch Katrine. *Mr. Turner.* Inverary! and Glen Ach-na-shilloch, Rossshire. *Messrs Borrer & Hooker.* Appin. *Rev. J. M. Crombie.*

IRELAND:—County of Antrim. *Dr. Taylor.* Curraghmore, Waterford and Glengariff, Cork; Cromaglowu, Killarney. *Adm. Jones.* Turk Mountains; and Dinis Island; Glenbower Wood, Killeagh. *Mr. Carroll.*

WALES:—Barmouth! *Rev. T. Salwey.* Dolgelley. *Dr. Holl.*

7. *P. curvescens*, Mudd. *dark brown* or *nearly black*, *effuse*, *thin*, *granulose* or *minutely squamulose*; *apothecia dark reddish-brown*, *margin inflexed*, *hypothecium pale*; *spores 6—8*, *colourless*, *fusiform*, *curved*, *simple*.

On *Andræa alpina*, very rare. 1860.

SYN:—Mudd Man. Br. Lich. 125. (1861).

FIG:—Mudd Man. t. 2. f. 38.

GEOG. DISTRIB:—Europe.

BOT. PROV:—15.

SCOTLAND:—Top of Ben Lawers. *Adm. Jones.*

8. *P. nebulosa*, (Hffm.) *cinereous* or *darkly cæsiocinerascent*, *granulato-crustose*, granules thin, imbricato-congested, crenate, forming a thin crust; *apothecia biatorine*, rufous or rufo-fuscescent, small, plane or slightly convex and crowned with the thallus; spores 8, colourless, ellipsoid or oblong, simple.

On walls, very rare. 1869.

SYN:—Hffm. Fl. Germ. 166. (1795.) Nyl. Scand. 125.

EXS:—Nyl. 114.

GEOG. DISTRIB:—Europe.

BOT. PROV:—15...31.

SCOTLAND:—Killin. *Rev. J. M. Crombie*.

CHANNEL ISLANDS:—Trinity and Quenvais, Jersey. *Mr. Larbal-estier*.

### B. Spores 1-septate.

9. *P. nigra*, (Huds.) *dark cinereo-nigricant* or *fuscous-black or black*, minutely and densely *coralloideo-granuloso-crustaceous*, *diffRACTO-areolate*, bounded by an expanded distinct bluish-black *byssoid hypothallus*; *apothecia black*, plane or slightly convex, margin entire, concolorous, *hypothecium nigro-fuscous*; spores 8, colourless, ellipsoid, 1-septate.

On calcareous rocks. 1778.

SYN:—Hudson Fl. Angl. ed. 2. 524. (1778.) Nyl. Scand. 126. *Collema*, Ach. Syn. 308.

FIG:—E. Bot. 1161. Nyl. Scand. fig. 2. b.

EXS:—Schær. 226. Mass. 354. Mudd 144. Anzi It. S. 9. Hepp 9.

GEOG. DISTRIB:—Europe, Africa, N. America, New Zealand.

BOT. PROV:—1...5 ..7, 8 ..10, 11, 15...28...30...31.

ENGLAND:—St. Ives, Cornwall. *Mr. Hudson*. Kirkby Lonsdale, Westmoreland. *Sir J. E. Smith*. Durham. *Rev. J. Harriman*. Worthing, Sussex; Oswestry! *Rev. T. Salwey*. Bridge near Upton-on-Severn. *Mr. E. Lees*. Bilsdale!; Rivaux; near Yarm; near Stanhope, Durham. *Mr. Mudd*. Ingleborough. *Dr. Carrington*. Hudshead; Old Castle, Berwick-on-Tweed. *Dr. Johnston*. Cleadon and Boldon Hills; Gateshead Fell and near Eglestone, Durham. Scotswood and Heaton Denes, and Heddon-on-Walls, Northumberland. *Mr. Winch*. Malvern; S. Devon; Derbyshire. *Dr. Holl*. Exmouth, Torquay. *Mr. Piggott*. Edgock, Worcestershire; Oversley Bridge, Warwickshire. *Mr. Purton*. High Rock near Biddulph! Shropshire; Breedon Hill, Leicestershire; Llanymynech Hill!

SCOTLAND:—Ben Lawers. *Dr. Holl*. Crombie En. 43. mentions a var. *triseptata*, Nyl. sporis 3-septatis, as abundant in Appin.

IRELAND:—Armagh. *Adm. Jones*. near Belfast. *Mr. Thompson*. common on limestone rocks. *Mr. Carroll*.

WALES:—Denbighshire. *Mr. Griffiths*.

CHANNEL ISLANDS:—Common on all the Islands. *Mr. Lerbalestier*.

10. *P. cheilea*, Nyl. *greyish or olive-brown, squamulose, squamulæ cartilaginous, minute, rounded and turgid, dilated, inciso-lobate, crenate, crowded, imbricate, crustaceous, diffracto-areolate, hypothallus fusco-nigricant; apothecia subinnato-sessile, fuscous, plano-convex, margin thin, entire or crenate; spores 8, colourless, elliptico-oblong or ovate, 1-septate.*

On moist shady maritime rocks, rare. 1860.

SYN:—Nyl. in Mudd Man. Br. Lich. 126. (1861).

GEOG. DISTRIB:—Europe.

BOT. PROV.:—19...24...29.

IRELAND:—Stroove Head, Donegal. *Prof. Dickie*. Blackwater Bridge; Kilkee, Clare; Western Blasquet Island, Kerry! *Mr. Carroll*.

11. *P. carnos*a, (Dicks.) *livido-fuscescent or cervino-fuscescent, squamuloso-lobate, lobes variously divided or crenato-incised, margins thickened granoso-crenate, imbricate or adscendenti-congested, whitish beneath; apothecia fuscous or fusco-rufescent, margin paler; spores 8, colourless, oblongo-fusiform or ellipsoid, 1-septate.*

On mosses in sub-alpine localities. 1790.

SYN:—Dicks. Crypt. Br. 2. 21. (1790.) *muscorum*, Ach. Syn. 193. Nyl. Scand. 127.

FIG:—Dicks. Cr. Br. 2. t. 6. f. 7. E. Bot. 1684.

EXS:—Fries. 44. Anzi Langob. 86. 87. Schær. 482.

GEOG. DISTRIB:—Enrope.

BOT. PROV.:—1...5, 7...11, 12.. 15, 16 ..19...23.

ENGLAND:—Teesdale, Durham. *Rev. J. Harriman*. S. Brent, Devon. *Dr. Holl*. Didworthy, Devon. *Rev. J. M. Crombie*. Castle-ton rocks! Cumberland. *Mrs. Stanger*. Oswestry! *Rev. T. Salwey*. Hag Crag wood in Teesdale Forest, Durham. *Mr. Winch*.

SCOTLAND:—Highlands. *Mr. Dickson*. abundantly in a ravine at foot of Ben More, Perthshire; Loch Awe in Argyle; Glen Ey; Ben Lawers! *Rev. J. M. Crombie*.

IRELAND:—Dublin Mountains. *Adm. Jones*. Askew Wood; Killarney. *Dr. Taylor*.

WALES:—Denbighshire. *Mr. Griffiths*. Cwm Bychan; Rhinog Fach near Barmouth. *Rev. T. Salwey*. Dolgelley. *Dr. Holl*.

Var. *determinata*, Nyl. *microphylline*, sub-effuse, margin of apothecia reddish-yellow; spores pale, *fuscous*, 1-septate.

On moist earth. 1860.

SYN:—Nyl. Lich. Scand. 128. (1861.)

GEOG. DISTRIB:—Scandinavia.

BOT. PROV.:—22, 23...30.

ENGLAND:—Dublin Mountains; Luggelaw co. Wicklow; Carnlough co. Antrim. *Adm. Jones.*

12. *P. plumbea*, (Lightf.) livido-cinerascent, submonophyllous, orbicular, adnate, frequently granuloso-rugose in the centre, radiato-incised, *laciniae longitudinally radiato-plicato-rugose or striated, concentrically arcuato-rugulose* towards the margins which are broadly expanded and crenate, *hypothallus dark plumbeo-cærulescent, tomentoso-filamentose*; apothecia reddish-brown, plane, margin paler, entire; spores 8, colourless, ellipsoid, simple.

On trees, rare. 1777.

SYN:—Lightfoot Fl. Scot. 2. 826. (1777.) Ach. Syn. 202. *Coccocarpia*, Nyl. Scand. 128.

FIG:—Lightfoot Fl. Scot. t. 26.

EXS:—M. & N. 939. Maudon. 14. Schær. 564. Larbal. 72.

GEOG. DISTRIB:—Europe, N. Africa.

BOT. PROV:—1, 2...6, 7...11, 12, 13...15...19, 20...31.

ENGLAND:—Keswick, ! Cumberland. *Mrs. Stanger.* near Eglestone, Durham. *Rev. J. Harriman.* Sussex. *Mr. J. Hemmings.* near Bodmin and Liskeard. *Messrs Turner & Sowerby.* Healey-field and Middleton-in-Teesdale, Durham. *Mr. Winch.* S. Devon and Cornwall. *Dr. Holl.* Appuldercombe, Isle of Wight. *Rev. A. Bloxam.*

SCOTLAND:—Fall of Foyers, Caledonian Canal; Glen Nevis, Lochaber; Loch-Lomond between Tarbet and Arrochar! *Dr. Lindsay.* Drumlanrig; Barntimperm Linn, Moffat. *Dr. Burgess.* Birks of Aberfeldy. *Mr. Macmillan.* Glen Falloch; Killin. *Dr. Holl.* Grampians. *Rev. J. M. Crombie.*

IRELAND:—Killarney; Gougaunearra; Cork; &c. *Mr. Carroll.* Mucross; Killarney. *Dr. Carrington.*

WALES:—Near Beaumaris! *Rev. A. Bloxam.* Cardiganshire. *Sir J. E. Smith.*

CHANNEL ISLANDS:—Guernsey. *Rev. T. Salwey.* Alderney; La Coupe, Jersey; Crévichou! *Mr. Larbalestier.*

### SUB-TRIBE III. AMPHILOMEI.

Thallus monophyllo-lobate, submembranaceous, soft, pulverulent, containing granula gonima. Apothecia scutelliform, thallodally margined.

### III. AMPHILOMA, (*Fr. pr. p.*) Nyl.

Characters as above.

1. *A. lanuginosum*, (Ach.) whitish or albo-fuscescent, adnate, lobato-dilated, lobes subimbricate, margins rotundato-crenate, *granuloso-pulverulent*, hypothallus to,

mentose, cærulescenti-nigricant; apothecia rufous, margin pulverulent.

On shaded mossy rocks, frequent. 1790.

SYN:—Ach. Prodr. 120. (1798.) Syn. 201. Nyl. Scand. 129.

FIG:—Dicks. Cr. Br. t. 6. f. 1.

EXS:—Nyl. 37. Schær. 378. M. & N. 446. Anzi It. S. 149. Leight. 55.

GEOG. DISTRIB:—Europe.

BOT. PROV:—5...7, 8...10, 11, 12...15...(19---30)...31.

ENGLAND:—Keswick! Cumberland. *Mrs. Stanger*. Craigforda! near Oswestry. *Rev. T. Salwey*. Broughton Bank! near Frosterley; Faleon Clints, Durham; Kildale. *Mr. Mudd*. Bolton. *Dr. Carrington*. Malvern Hills. *Dr. Holl*. Bardon Hill; Charnwood Forest, Leicestershire. *Rev. A. Bloxam*. Llanymynech Hill! Haughmond Hill! Stiperstones! Sharpstones! &c., Shropshire.

SCOTLAND:—Trossachs; Craig Cluny, Braemar, Lochaber. *Rev. J. M. Crombie*.

IRELAND:—On moist mossy rocks not uncommon. *Mr. Carroll*.

WALES:—Dolgelley!

CHANNEL ISLANDS:—Guernsey. *Rev. T. Salwey*. Boulay Bay, Jersey. *Mr. Larbalestier*.

#### SUB-TRIBE IV. SQUAMARIEI.

Thallus radioso-laciniate or cartilagineo-squamosæ, often radiate. Apothecia lecanorine. Spores colourless, ellipsoid, simple. Paraphyses distinct. Spermatia aciculari-cylindrical, long, arcuate.

#### IV. SQUAMARIA, DC.

Characters as above.

1. *S. crassa*, (Huds.) pale yellow or whitish-green, squamoso-imbricate, squamæ cartilaginous, imbricated, lobato-crenate, more or less depressed, under surface brown; apothecia testaceo-rufous, plane, margin entire; spores 8, colourless, ellipsoid, simple.

On earth in limestone regions, frequent. 1741.

SYN:—Hudson Fl. Angl. 2nd. ed. 530. (1778.) Ach. Syn. 190. Nyl. Scand. 130.

FIG:—E. Bot. 1893. Hepp Sporen t. 70. f. 616. Sturm Fl. D. t. 9.

EXS:—Mass. 72. 73. 74. M. & N. 1051. Nyl. L. P. 116. Mudd. 91. Bohl. 2. Anzi It. S. 155. Rabh. 739. Hepp 616. Schær. 343. Arn. 2. Larbal. 73.

GEOG. DISTRIB:—Europe, Africa.

BOT. PROV:—1, 2...5...7, 8...10, 11...14...23 ..27 ..31.



ENGLAND :—St. Vincents rocks, Bristol. *Sir J. E. Smith*. Durdham Down ; Bristol ! *Mr. Mudd*. Oswestry ! Shropshire. *Rev. T. Salwey*. Eglestone, Durham. *Rev. J. Harriman*. Wensleydale, Yorkshire. *Mr. Brunton*. Hurstpierpoint, Sussex. *Mr. Hemmings*. near Settle. *Dr. Windsor*. Malham, Yorkshire ; Westmoreland. *Mr. Hudson*. Marble Stone near Middleton-in-Teesdale, Durham. *Mr. Winch*. near Torquay ; near Buxton. *Dr. Holl*. Berry Head ; Croyd Bay, N. Devon. *Mr. Parfitt*.

SCOTLAND :—King's Park, Edinburgh. *Rev. J. Lightfoot*. Pentland Hills. *Dr. Greville*.

IRELAND :—Morningside co. Meath ; Skerries near Dublin ! *Dr. Moore*. near Dublin. *Mr. Carroll*. Ben Bulbin, Sligo. *Prof. Dickie*.

WALES :—Puffin Island near Beaumaris. *Rev. A. Bloxam*. Holywell ! Flintshire. *Prof. Churchill Babington*. Llandwellyn rocks near Newborough, Anglesea ; Glyders. *Dillenius*. (1741.)

CHANNEL ISLANDS :—Quenvais, Jersey ; Coast of Herm ! *Mr. Larbalestier*. Guernsey. *Rev. T. Salwey*.

2. *S. lentigera*, (Web.) pale yellowish or greenish-white, orbicular, appressed, areolato-squamose in the centre, radiato-lobate at the circumference, rotundato-undulato-crenate, margin thickened, upturned, albo-pulverulent, under surface white ; apothecia pallido-testaceous, margin entire ; spores 8, colourless, ellipsoid, simple.

On chalky earth, rare. 1785.

SYN :—Weber Spicil. 192. (1778.) Ach. Syn. 179. Nyl. Scand. 130.

FIG :—E. Bot. 871. Web. Spicil. t. 3. Relh. Cant. t. 7. Hepp t. 20 f. 179.

ENS :—Hepp 179. M. & N. 68. Schær. 484. Anzi It. S. 154. Dicks. 23. Mass. 91. Maudon 51.

GEOG. DISTRIB :—Europe, Africa.

BOT. PROV :—2...4, 5.

ENGLAND :—Gogmagog Hills ; Newmarket Heath, Cambridge. *Rev. R. Relhan*. (1785). near Newhaven, Sussex. *Mr. Hemmings*. Hord's Park near Bridgnorth, Salop. *Mr. Purton*.

3. *S. cartilaginea*, (Westr.) cinereo-virescent or albidostamineous, opaque, cartilaginous, imbricate, multifido-laciniate, laciniae linear, sinuato-flexuose, crenate, under surface whitish ; apothecia carneo-testaceous or fulvo-testaceous, plane, irregularly lobate, margin pale, persistent, inflexed, entire ; spores 8, colourless, ellipsoid, simple.

On maritime rocks, rare. 1800.

SYN :—Westring in Nov. Act. Stockh. 307. (1791.) Ach. Syn. 191. Nyl. Scand. 132.

FIG :—E. Bot. Suppl. 2802. Hepp Sporen t. 8. f. 59.

EXS :—Zw. 188. Hepp 59. M. & N. 1050.

GEOG. DISTRIB :—Europe.

BOT. PROV :—7...10.

ENGLAND :—Yorkshire. *Mr. Alexander.* (1800).

WALES :—On rocks on the shore near outlet of Llyn Bodlyn, above Barmouth ! *Rev. T. Salwey.*

4. *S. saxicola*, (Poll.) *ochroleucous* or pallido-sulphureo-virescent, cartilaginous, orbicular, appressed, *areolato-imbricato-crustaceous* at the centre, *radiato-lobate* towards the circumference, lobes contiguous, plane or subuplicate, smooth, crenate ; apothecia pallido-testaceous, or testaceo-rufescent, plane, margin entire or crenulate ; spores 8, colourless, ellipsoid, simple.

On rocks, not unfrequent. 1785.

SYN :—Pollich Pal. El. 3. 225. (1777.) Ach. Syn. 180. Nyl. Scand. 133.

FIG :—E. Bot. 1695. Hffm. Pl. L. t. 16. 1. Mass. Ric. f. 36.

EXS :—Anzi It. S. 159. 160. Schaer. 332. W. & N. 67. 67. Bohl. 55. Mudd 92. Fries. 163.

GEOG. DISTRIB :—Throughout the world.

BOT. PROV :—3. 4. 5. 7, 8...10, 11...15...(19---30)...31.

ENGLAND :—Cambridge. *Rev. R. Relhan.* Oxford. *Dr. Sibthorp.* Cliffrigg ! Cleveland. *Mr. Mudd.* Gunnerton Crags near Barnesford ; near Warden Mill ; Carham and Wark by the Tweed, Northumberland ; near Urpeth ; Cawsey Hall ; near Eglestone and Gainford, Durham. *Mr. Winch.* Kelvedon, Essex. *Mr. Varenne.* Bedfordshire. *Rev. C. Abbot.* Twycross Church, Leicestershire. *Rev. A. Bloom.* Midland Counties. *Mr. Purton.* Malvern Hills. *Rev. W. S. Rufford.* Lyth Hill ! Middle ! Bodbury Ring ! Shropshire.

SCOTLAND :—Clova ; Reeky Linn ; near Breehin ; Balbeuchly ; Broughty Castle ; Hare Craigs ; Ninewells ; Paddock Stane near Invergowrie. *Mr. Gardiner.*

IRELAND :—On rocks, not unfrequent. *Mr. Carroll.* near Belfast. *Mr. Templeton.* Kerry. *Dr. Taylor.*

WALES : Diganwy ! near Conway.

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.* Jersey. *Mr. Larbalestier.*

Var. *diffracta*, Ach. *areolato-diffract*, areolæ contiguous, angular, *nigro-marginate*.

On rocks.

SYN :—Ach. L. U. 432. (1810.) Syn. 180. Nyl. Scand. 133.

EXS :—Leight. 81. Mudd 93. Mass. 360, Anzi Langob. 269.

GEOG. DISTRIB :—Europe.

BOT. PROV :—5...19...15.

ENGLAND :—Cliff-Rigg ! ; near Ayton ! Lanbraugh rigg ! Cleveland. *Mr. Mudd.* Haughmond Hill ! Shropshire.

SCOTLAND :—Monument Hill, Perth ! ; Abernethy ! Ben Lawers !  
*Dr. Lindsay.* Craig Guie in Braemar. *Rev. J. M. Crombie.*

Var. *versicolor*, (Pers.) *albo-flavescent*, more or less *albo-suffused*, the upper surface of laciniae towards the circumference *minutely albo-depresso-granulate*, margin of apothecia entire, often *albo-pulverulent*.

On rocks and moss. 1856.

SYN :—Pers. in Ust. N. Ann. Bot. st. 7. p. 24. (1794.) Ach. Syn. 184. Nyl. Scand. 133,

EXS :—Anzi Venet. 30. It. S. 161, Langob. 41. Hepp. 899.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2.

ENGLAND :—On roof tiles, Basingstoke ! Hants. *Mr. Rob. Southey Hill.* (1856).

5. *S. gelida*, (L.) *dirty creamy-white*, smooth, crustaceous, *closely adnate*, *orbiculari-radiose*, plane, *areolato-diffract* in the centre, *radiato-laciniate* at the circumference, *truncato-crenate*, with central *carneo-cinerascent* *depresso-verrucaroid radiosio-rimose cephalodia* ; apothecia pale reddish, margin tumid entire ; spores 8, colourless, ellipsoid, simple.

On alpine rocks, frequent. 1782.

SYN :—Linn. Mant. 2. 133. (1771). Ach. Syn. 186. Nyl. Scand. 134.

FIG :—E. Bot. 692. Hepp Sporen t. 89. f. 773.

EXS :—Hepp 773, Th. M. Fr. 31.

GEOG. DISTRIB :—Norway, W. Finland, W. France, N. Zealand.

BOT. PROV :—5...7...11, 12...15...17, 18, 19...30.

ENGLAND :—High Force, Holwick, and Cronkley Fell, Teesdale. *Rev. J. Harriman.* Buttermere ; *Mrs. Stanger.* Ambleside. *Mr. Hailstone.* Winch Bridge ; Cauldron Snout ; Charnberry near Eglestone, and in Teesdale Forest, Durham. *Mr. Winch.* Stiperstones Hill ! Long Myd ! Shropshire.

SCOTLAND :—Glen of Lency near Stirling. *Dr. F. Buchanan.* (1782.) Fort Augustus, Caledonian Canal ! ; Ben Nevis ! ; Quiraing, Isle of Skye ! *Dr. Lindsay.* Ben Lawers, *Dr. Mainyay.* Clova ; Linn of Dee, Aberdeenshire. *Mr. Gardiner.* Kenmore. *Dr. Holl.* Breadalbane & Braemar. *Rev. J. M. Crombie.*

IRELAND :—Connor Cliffs Dingle ! Blase of Cahar, Mc Gillicuddy's rocks ; Pass of Keim-an-Eigh. *Mr. Carroll.* Dunkerron Mountain. *Dr. Taylor.* Glengariff ; Carnlough co. Antrim. *Adm. Jones.* Coast of Antrim. *Dr. Moore.*

WALES :—Near Gwastadannas ; Arthog ; Llyn Bodlyn. *Rev. T. Salwey.* Cader Idris !

#### SUBTRIBE V. PLACODEI.

Thallus radiate or laciniato-radiate. Apothecia leca-

norine or sub-biatorine. Spores 8, colourless, ellipsoid, polari-bilocular, rarely simple or 1-septate. Paraphyses distinct. Sterigmata articulate. Spermatia slender, shortly cylindrical.

## V. PLACODIUM, DC. *Nyl.*

Characters as above.

### A. *Thallus flavescent.*

1. *P. murorum*, (Hffm.) bright yellow, orbiculari-radiate, adnate, rimoso-areolate or rimoso-squamulose and whitish in the centre, *plicato-laciniate at the circumference, laciniae narrow, convex, incurved and subcrenate at the apices, very minutely granulate-scabrous on the upper surface*; apothecia dusky orange-coloured, disk minutely granulate, margin entire; spores 8, colourless, ellipsoid, polari-bilocular; K red or purple.

On walls, rocks, &c. frequent.

SYN:—Hffm. Enum. 63. (1784.) Ach. Syn. 181. *Nyl. Scand.* 136.

FIG:—Hffm. En. t. 9. f. 2. Pl. L. t. 17. f. 3. Hepp Sporen t. 22. f. 196.

EXS:—Hepp 196. *Nyl.* 119. Schær. 479. Mass. 58. 96. 97. 98. 93. in part. Mudd 94. 96. Zw. 58. Leight. 113. Arn. 383, 381.

GEOG. DISTRIB:—Throughout the World.

BOT. PROV:—3...5. 10, 11...(19--30)...31.

ENGLAND:—Bilsdale! Black Hall rocks near Hartlepool! *Mr. Mudd.* near Gainford, Durham, and coast of Northumberland. *Mr. Winch.* Kelvedon; Mistley, Essex. *Mr. Varenne.* Exeter. *Mr. Parfitt.* Midland Counties. *Mr. Purton.*

IRELAND:—Walls and rocks, common. *Mr. Carroll.*

CHANNEL ISLANDS:—Guernsey. *Rev. T. Salwey.* common on all the Islands. *Mr. Larbalestier.*

Var. *miniaturum*, (Hffm.) smaller, thallus *miniato-fulvescent*, minutely scabrous or punctellato-impressed; apothecia still deeper coloured.

On rocks, &c. 1794.

SYN:—Hffm. Pl. L. 3. 16. (1801.) Ach. Syn. 182. *Nyl. Scand.* 136

FIG:—Hffm. Pl. L. t. 60. f. 1.

EXS:—Anzi Langob. 29. 274. Hepp 195. 906. M. & N. 354. Mass. 104. Schær. 545. 338. right hand spec. Anzi It. S. 133. a.

GEOG. DISTRIB:—Throughout the World.

BOT. PROV:—5...8...11...18, 19.. 31.

ENGLAND :—Oswestry, ! Shropshire. *Rev. T. Salwey*, on Gainsford Church, Durham. *Rev. J. Harriman*. Derbyshire. *Sir J. E. Smith*.

SCOTLAND :—*Sir J. E. Smith*. (1794.) Stennis, Orkney. *Dr. Lindsay*.

IRELAND :—Blackwater Hill ; Dunkerron. *Dr. Taylor*.

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey*.

Var. *obliteratum*, (Pers.) *thallus* sub-effuso-areolate, almost *obliterated*, sub-effigurate or crenato-lobulate ; *apothecia* numerous and crowded. K red or purple.

On rocks.

SYN :—Persoon in Ust. Ann. Bot. st. 11. p. 15. (1794.) Ach. Syn. 182. Nyl. Scand. 136.

EXS :—Lindig 162. Mudd 95. Hepp 71. Anzi Langob. 275. Leight. 207. Larbal. 74.

GEOG. DISTRIB :—Europe, Asia, Africa, America.

BOT. PROV :—1...7...10...15...19...30. 31.

ENGLAND :—Ayton ! Yorkshire. *Mr. Mudd*. Torquay. *Dr. Holl*. N. Devon. *Mr. Parfitt*.

SCOTLAND :—Kincardine. *Rev. J. M. Crombie*.

IRELAND :—Coast of Antrim. *Dr. Moore*. Black rock, Cork. *Mr. Carroll*.

WALES :—Southerndown, Glamorgan. *Dr. Holl*. Llyn Aran ! Cader Idris.

CHANNEL ISLANDS :—Coast of Guernsey, Jersey, Sark, Herm, Jethou ! *Mr. Larbalestier*.

2. *P. decipiens*, Arn. *pale dirty vitellinous-yellow, opaque*, thin, crustaceous, *orbiculari-radiate*, adnate, *plicato-laciniate at the circumference*, laciniae narrow, convex, incurved and sub-crenate at the apices, *verrucoso-areolate in the centre*, conspicuously *granuloso-scabrous*, almost leprose, on the upper surface of the thallus and on the thalline margin of the apothecia ; apothecia concolorous, sunk, plane, waxy ; spores 8, colourless, ellipsoid, polaribilocular.

On calcareous rocks, rare. 1871.

SYN :—Arnold in Flora 1866. p. 530.

EXS :—Arn. 382. a. and b.

GEOG. DISTRIB :—Europe.

BOT. PROV :—5.

ENGLAND :—Llanymynech Hill ! Shropshire. (1871).

3. *P. callopismum*, (Ach.) bright yellow, *orbiculari-radiate*, adnate, *rimoso-areolate* and whitish in the centre, *lobato-laciniate at the circumference*, laciniae broad, thin, membranous, contiguous, very closely appressed, plane,



*dilated and inciso-crenate at the apices, smooth on the upper surface; apothecia bright orange, disk smooth, waxy, margin bright yellow, thickish, flexuose or sub-crenulate; spores 8, colourless, lemon-shaped, polari-bilocular; K red or purple.*

On rocks, walls, &c. frequent.

SYN:—Ach. L. U. 437. (1810.) Syn. 184. Mudd Man, 133. Nyl. in Bull. Soc. Bot. 13. p. 366.

FIG:—Hepp Sporen t. 103. f. 907. E. Bot. 2157. upper fig.

EXS:—Nyl. 36. Hepp 907. Mass. 103. Schær. 337. Anzi It. S. 134.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1...5, 6...10...14, 15.. 30.

ENGLAND:—Craig-y-Rhiw! near Oswestry, Shropshire. *Rev. T. Salwey*. Danby Castle! Bilsdale, Cleveland. *Mr. Mudd*. Torquay. Devon. *Dr. Holl*. Budleigh Salterton, Devon. *Dr. Dickie*. Llanymynech Hill! Shropshire.

SCOTLAND:—Near Aberdeen and Stirling; near Edinburgh. *Rev. J. M. Crombie*.

IRELAND:—Co. Down. *Dr. Maingay*.

WALES:—Southerndown, Glamorgan. *Dr. Holl*.

Var. *plicatum*, Wedd. *laciniae* of thallus narrow, convex, incurved and sub-crenate at the apices, precisely like those of *P. murorum*, but smooth and waxy on the upper surface; spores lemon shaped; K red or purple.

On rocks, &c. frequent.

SYN:—Weddell in Bull. Soc. Bot. 16. p. 200. (1869.) Nyl. l. c. 13. 366.

FIG:—Hepp Sporen t. 22. f. 197.

EXS:—Hepp 197. Anzi Langob. 444. a. Mass. 94. 95. Anzi S. 134. b. Fellm. 103. Mudd 96,

GEOG. DISTRIB:—Europe.

BOT. PROV:—5...10.

ENGLAND:—Craig-y-Rhiw! near Oswestry, Shropshire. *Rev. T. Salwey*. Yorkshire! *Mr. Dixon*. Aymestry! Herefordshire. Llanymynech Hill! Shropshire.

4. *P. citrinum*, (Ach.) yellow, crustaceous, effuse, granuloso-leprose, rimoso-areolate; apothecia yellowish-orange, plane, margin sub-entire, pulverulent; spores 8, colourless, ellipsoid, polari-bilocular. K purple.

On rocks, walls, mortar, &c. frequent. 1807,

SYN:—Ach. Prodr. 73. (1798.) Nyl. Scand. 136.

FIG:—E. Bot. 1793. Hepp Sporen t. 9. f. 72.

EXS:—M. & N. 742. Nyl. 35. Hepp 72. Leight. 86. Anzi Langob, 32. Zw. 323. Arn. 257. Anzi Ven. 25.

GEOG. DISTRIB:—Europe, America.

BOT PROV:—3, 4, 5...10.. (19—30).. 31.

ENGLAND :—Norfolk. *Sir J. E. Smith*. Yorkshire. *Mr. Hailstone*. Worcester! *Dr. Holl*. Heavitree, Exeter. *Mr. Parfitt*. Kelvedon, Essex. *Mr. Varenne*. Llanymyech Hill! Shrewsbury! and Shropshire, frequent!!

IRELAND :—On mortar, common. *Mr. Carroll*.

CHANNEL ISLANDS :—Jersey; Guernsey; Sark; *Mr. Larblestier*.

5. *P. elegans*, (Link.) *dark orange-red*, suborbiculari-stellate, laciniae *distinct, linear*, narrow, *multifid*, upper surface *glabrous*; apothecia *dark orange-red*, plane, margin entire; spores 8, colourless, ellipsoid, polar-bilocular.

On exposed rocks and stones, rare.

SYN :—Link. in Ann. Bot. 1, 37. (1794.) Nyl. Scand. 136. Mudd Man. 131.

FIG :—Hepp Sporen t. 22. f. 195. E. Bot. 2181. (right hand fig. only).

EXS :—Schær. 481. Anzi It. S. 133. c.

GEOG. DISTRIB :—Europe, Arctic America, N. Zealand.

BOT. PROV :—8...11, 12.. 14, 15...31.

SCOTLAND :—Lochnagar. *Adm. Jones*. Cairngorm, Grampians. *Rev. J. M. Crombie*. Ben Mac Dhui. *Dr. Dickie*.

6. *P. fulgens*, (Sw.) *albido-flavescent* or *citrine*, orbicular, *sub-monophyllous*, *adnate*, *radiato-incised* towards the circumference, laciniae *subplicato-contiguous*, crenate, upper surface *granulato-pulverulent*; apothecia *orange-coloured*, plane, margin thick, entire, pale yellow; spores 8, colourless, ellipsoid, simple. K purple.

On the earth amongst rocks, rare. 1801.

SYN :—Swartz. in Nov. Act. Acad. Upsal. 4. 246. (1784.) Ach. Syn. 183. Nyl. Scand. 137.

FIG :—E. Bot. 166. Hffm. Pl. L. t. 48. f. 2. Hepp Sporen t. 21. f. 194. Anzi Langob. 99. Anzi Etr. 53.

EXS :—Hepp 194. Mass. 2. Schær. 339. M. & N. 1052. Larbal. 27.

GEOG. DISTRIB :—Europe, Africa.

BOT. PROV :—1, 2 ..6...31.

ENGLAND :—Freshwater Bay, Isle of Wight; New Haven, Sussex. *Messrs Turner & Borrer*. Bray Hill St. Minver near Padstow! *Rev. R. V. Tellam*.

WALES :—Near Stackpole Court, Pembroke. *Mr. Adams*. (1801.) Lydstop! Pembroke. *Rev. T. Salwey*.

CHANNEL IRELANDS :—Quenvais! Jersey; Grosse Rocque, Guernsey. *Mr. Larbalestier*. North side, Guernsey, *Miss Lukis*.

### B. *Thallus cinerascens*.

7. *P. candicans*, (Dicks.) *glaucous* or *albo-cinerascent*, tartareous, *orbiculari-squamose*, *adnate*, *radiato-plicato*-

*lobate*, rotundo-dilated and crenate at the apices, smooth or pulverulent; apothecia appressed, brownish-black, more or less pruinose, thallodal margin *persistent*; spores 8, colourless, ellipsoid, 1-septate.

On limestone rocks, frequent. 1793.

SYN:—Dickson Br. Crypt. 3. 15. (1793.) Nyl. Prodr. 72. *Lecanora epigæa*, Ach. Syn. 179.

FIG:—E. Bot 1778. Dicks. Crypt. 3. t. 9. f. 5. Hepp Sporen t. 104. f. 914.

EXS:—Zw. 111. Nyl. 117. Mass. 210. Arn. 223. a. b. Leight. 218. Hepp 914. Anzi Ètr. 12. Rabh. 748.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1, 2...5...7, 8...10, 11...15.

ENGLAND:—Yorkshire. *Mr. Dickson*. (1793.) Cheddar; ! near Bristol; Beachy Head! Sussex. *Mr. Borrer*. Oswestry! Shropshire. *Rev. T. Salwey*. Teesdale, Durham. *Rev. J. Harriman*. St. Vincent's Rocks, Bristol. *Miss Atwood*. near Buxton. *Dr. Holl*. Chudleigh, Devon. *Mr. Parfitt*. Malvern, Worcester. *Mr. Varenne*. Llanymynech Hill! Wrekin Hill! High Rock! near Bridgnorth, Shropshire.

SCOTLAND:—Near Sheean Ferry. *Messrs. Turner and Hooker*.

WALES:—Great Ormes Head!

8. *P. chalybæum*, (Duf.) *plumbeo-albicant* or cinereo-albescent, adnate, smooth, *diffRACTO-areolate*, *obsoletely lineari-radiate* at the circumference, hypothallus blackish, slightly extended beyond the thallus; apothecia *innate* or immersed, black, plane, more or less pruinose, *thalline margin entire*, depressed; spores 8, colourless, elliptico-oblong, *polari-bilocular*.

On limestone rocks, rare. 1861.

SYN:—Dufour in Fries L. Eur. 125. (1831.) Nyl. Scand. 138. Mudd Man. 134.

FIG:—Hepp Sporen t. 22. f. 204.

EXS:—Hepp 204. Schær. 566. Zw. 226. Anzi Langob. 35.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1...7...10...15.

ENGLAND:—Near Parhill, Yorkshire. *Mr. Baker*. Babbiecomb, Devonshire. *Adm. Jones*. Llanymynech Hill! Shropshire.

SCOTLAND:—Craig Tulloch! Blair Athole. *Rev. J. M. Crombie*.

WALES:—Eglschw Rocks! near Llangollen.

9. *P. variabile*, (Pers.) *fusco-cinereous*, adnate, *diffRACTO-areolate*, hypothallus nigricant, predominant; apothecia prominent, black, plane, more or less pruinose, *thalline margin thin, white, sub-crenulate*; spores 8, colourless, elliptico-oblong, *polari-bilocular*.

On rocks, rare.

SYN :—Pers. in Ust. Ann. Bot. 7. 26. (1794.) Ach. 165. Nyl. Scand. 138.

EXS :—Anzi It. S. 143.

GEOG. DISTRIB :—Scandinavia, Italy.

BOT. PROV :—8...15.

ENGLAND :—Buxton, Derbyshire ! Dr. Holl. Llanymynech Hill ! Shropshire.

SCOTLAND :—Craig Culliach. Rev. J. M. Crombie.

## SUB-TRIBE VI. EULECANOREI.

Thallus crustaceous, granulose, rarely radiate, smooth or leprose. Apothecia lecanorine, rarely biatorine. Paraphyses distinct. Spores simple, rarely septate, colourless, rarely fuscous. Spermatia various in form in different species, e.g. cylindrical or acicular, straight or arcuate, or oblongo-ellipsoid.

## VI. LECANORA. (Ach.) Nyl.

Characters as above: Thecæ either 8-spored or polysporous.

### A. Spores numerous.

1. *L. crenata*, Nyl. bright full yellow, sub-orbicular, effuse, crenato or granuloso-squamulose in the centre, laciniato-radiate at the circumference, laciniae sublinear, very narrow, convex, incised, crenate and incurved at the apices (K—C—); apothecia darker yellow, plane, thalline margin elevated, crenulate; spores numerous, colourless, oblong or sub-ellipsoid, bilocular.

On maritime rocks. 1866.

Hydrate of potash just tinges the thallus a pale reddish brown.

SYN :—Nyl. Lapp. Or. 130. (1866.) *L. crenulata*, Wahlenberg Fl. Lapp. 416. Th. M. Fries Lich. Arctoi 70. Nyl. Scand. 140. Ach. Syn. 181.

EXS :—Th. M. Fries 58.

GEOG. DISTRIB :—Scandinavia, Norway, Greenland.

BOT. PROV :—7.

WALES :—Aberdovey ! Rev. A. Bloxam. These Welsh specimens were sterile and not well developed, but the appearance of the laciniae of the thallus accorded well with Fries Exs. 58 ! The asci especially the apices become blue with iodine.

2. *L. vitellina*, Ach. pale greenish-yellow, granulose, effuse, granules minute, crenate or sublobulate, or conglomerate (K—); apothecia tawny-yellow, plane, thalline

margin entire or crenulate ; spores numerous, colourless, oblong, simple or sub-polar-bilocular or obsoletely 1-septate.

On rocks, walls, old pales, &c. frequent. 1777.

SYN :—Ach. L. U. 403. (1810.) Syn. 174. Nyl. Scand. 141.

FIG :—E. Bot. 1792. Hfm. Pl. L. t. 26. f. 1. Hepp Sporen t. 9. f. 70.

EXS :—Schær. 450. M. & N. 741. Hepp 70.

GEOG. DISTRIB :—Europe, N. America, Abyssinia.

BOT. PROV :—1 ..3, 4, 5...11...15 ..18...30, 31.

ENGLAND :—Northumberland and Durham. *Mr. Winch.* Ex-minster ; Budleigh Salterton, Devon. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varcane.* Midland Counties. *Mr. Purton.* Cambridge. *Rev. R. Relhan.* Oxford. *Dr. Sitthorpe.* Haughmond Hill ! Middle ! Longmynd ! Shropshire.

SCOTLAND :—Garrynahine, Lewis. *Dr. Lindsay.* Killin. *Rev. J. M. Crombie.*

IRELAND :—Lurgedon Mountain co. Antrim. *Dr. Moore.*

CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier.*

Var. *coruscans*, Ach. *darker yellow, granuloso-conglomerate, areolato-diffract* (K—) ; apothecia *imbedded, rufo-fuscous, plane, thalline margin granulato-crenulate.*

On rocks and palings, frequent.

SYN :—Ach. Meth. p. 177. (1803.) Syn. 174. Nyl. Scand. 141.

FIG :—Hfm. Pl. L. t. 27. f. 2.

EXS :—Bohl. 78.

GEOG. DISTRIB :—Europe.

BOT. PROV :—5...10...15.

ENGLAND :—Ayton ! Cleveland. *Mr. Mudd.* Middle ! Shropshire.

SCOTLAND :—Killin. *Rev. J. M. Crombie.*

Var. *aurella*, Ach. *yellow, granulato-dispersed or evanescent*, (K—) ; apothecia *minute, bright orange, plane, scattered, thalline margin entire.*

On rocks, frequent.

SYN :—Ach. L. U. 404. (1810.) Syn. 175. Nyl. Scand. 141.

FIG :—Hfm. Pl. L. t. 50. f. 2. c.

GEOG. DISTRIB :—Europe.

BOT. PROV :—5, 7...15.

ENGLAND :—Middle ! Shropshire.

SCOTLAND :—Killin. *Rev. J. M. Crombie.*

WALES :—Conway ! and Diganwy !

Var. *epixantha*, (Nyl.) *leprose, pulverulent, pale yellow ;*



apothecia appressed or sub-immersed, plane, concolorous, margin thick, entire, often pulverulent.

On turf walls. 1870.

GEOG. DISTRIB:—Europe.

BOT. PROV:—15.

SCOTLAND:—Kincardine. *Rev. J. M. Crombie*. (1870).

3. *L. candelaria*, Ach. greenish-yellow, sub-orbiculari-stellate, minutely laciniate, laciniae multifid, subimbricate, crowded, margins curled, crisped, more or less minutely granulose (K—C—); apothecia fulvescent, margin entire or granulose; spores numerous, colourless, ellipsoid, simple.

On old trees, pales &c. not common. 1782.

SYN:—Ach. L. U. 416. (1810.) Nyl. Syn. 412. Scand. 108.

FIG:—E. Bot. 1794. Nyl. Scand. t. 1. f. 2.

EXS:—Mass. 61. Anzi It. S. 131. M. & N. 743. a. (in part.)

GEOG. DISTRIB:—Europe.

BOT. PROV:—1...3, 4, 5...10, 11 . 14, 15. .19. .31.

ENGLAND:—Bolton Wood. *Dr. Carrington*. Northumberland and Durham. *Mr. Winch*. near Torquay. *Dr. Holl*. Kelvedon; Lyston, Essex. *Mr. Varoune*. Poplills, Warwickshire. *Rev. W. S. Rufford*. Hord's Park near Bridgnorth. *Mr. Purton*. Bedford. *Rev. C. Abbot*.

SCOTLAND:—Blackford Hill near Edinburgh. *Sir J. E. Smith*. (1782.) Killin; Blair Athole; Portlethen, Kincardineshire. *Rev. J. M. Crombie*.

IRELAND:—Near Cork. *Mr. Carroll*.

CHANNEL ISLANDS:—Guernsey. *Rev. T. Salvey*.

Var. *granulosa*, laciniae very minute, crenate, margins ascending, minutely and abundantly granulose, often crowded into an areolato-diffracto-granulose crust, (K—).

On old trees, frequent.

EXS:—Zw. 322. Wright. 79. Leight. 12.

GEOG. DISTRIB:—Europe.

BOT. PROV:—5.

ENGLAND:—Old Elms, Berwick! near Shrewsbury.

4 *L. glaucocarpa*, (Whlhb.) pallescenti-livid, or lurido-rufescent, squamulose, squamulae dispersed or imbricate, crenate, margins upturned and white, (K—C—); apothecia large, fusco-rufescent, plano-convex, castio-pruinose or naked, margin elevated, entire and flexuose; spores numerous, colourless, oblong, simple.

On calcareous alpine rocks, not common.

SYN:—Whlhb. Nov. Act. Sc. Stockh. 27. 143. (1806.) Ach. Syn.

189. Nyl. Scand. 175. *præna* (non Ach.) Mudd Man. 159.

FIG:—Whlhb. l. c. t. 4. f. 4. Hepp Sporen t. 42. f. 377.

EXS:—Schar. 613. 341. Mass. 284. 283. 235. Anzi Langob. 323.

127. 329. Hepp 377. 378. Anzi It. S. 215.

GEOG. DISTRIB:—Sweden, Bavaria, Austria, Italy, Pyrenees, Switzerland, Lombardy, Hungary, Mackenzie River.

BOT. PROV:—5...9, 10...15.

ENGLAND:—Lancashire. *Mr. Jacob. Cleveland. Rev. J. M. Crombie. Craig-y-Rhiw near Oswestry!*

SCOTLAND:—Breadalbane; Braemar; Ben Lawers; Morrone; Craig Guie. *Rev. J. M. Crombie.*

forma *pruinosa*, (Sm) *crustaceous* (K—C—); *apothecia* of moderate size, scattered, appressed, plane, *reddish-black* or *black*, *white within*, *cæsio-pruinose* or *naked*, margin thin, entire, more or less undulate; spores numerous, colourless, ellipsoid, simple.

On mortar, limestone rocks, &c. frequent. 1811.

SYN:—Smith E. Bot. 2244. (1811.) Nyl. Scand. 176.

FIG:—E. Bot. 2244. Hepp Sporen t. 17. f. 143.

EXS:—Anzi Langob. 395. Anzi Venet. 78. Anzi It. S. 289. Hepp 143. Schar. 262. Mass. 334. 335. Mudd. 160. Leight. 300.

GEOG. DISTRIB:—Hungary, Italy, Switzerland.

BOT. PROV:—2...5...7...10, 11...15...19.

ENGLAND:—Near Gainford, Durham. *Rev. J. Harriman. (1811.) Bilsdale! Yorkshire. Mr. Mudd. Llanforda! lane near Oswestry. Rev. T. Salwey. Sussex! Mr. Borrer. near Malvern and Worcester; near Shanklin, Isle of Wight. Dr. Holl. near Polesworth, Warwickshire. Rev. A. Bloxam. Wenlock!; High Rock! near Bridgnorth; Alberbury Castle Walls! Shropshire.*

SCOTLAND:—Highlands. *Rev. J. M. Crombie.*

IRELAND:—Monkstown and Dunkathal near Cork. *Mr. Carroll.*

WALES:—Meifod Church! *Rev. T. Salwey. Aberdovey! Rev. A. Bloxam. Diganwy! near Conway.*

forma *eucarpa*, Nyl. *evanescent*; *apothecia* reddish when moist, blackish dry, very large, aggregate, *internally rufescent*; *hypothecium* thin, black; spores numerous, colourless, oblongo-ellipsoid, simple, most minute.

On rocks, rare. 1867.

SYN:—Nyl. Coll. Gall. Mer. Pyr. 14. (1853.) Prodr. 146.

GEOG. DISTRIB:—Pyrenees.

BOT. PROV:—31.

CHANNEL ISLANDS:—Cove, Guernsey; north coast of Jersey. *Mr. Larbalestier. (1867.)*

5. *L. squamulosa*, (Schrad.) *cervine* or *badio-pallescent*, or *badio-fuscescent*, *squamulose*, *squamules adnate*,

*angular, and sub-lobate (K—C—); apothecia at first immersed and small, then emerged and plane, rufo-fuscescent or nigro-fuscescent, thalline margin depressed; spores numerous, minute, colourless, oblong, simple.*

**On rocks, frequent. 1801.**

SYN :—Schröd. Crypt. 153. (1797.) Schröd. in Journ. Bot. 1801.

1. 75. *L. cervina*. (Pers.) Ach. Syn. 188. Nyl. Scand. 174.

FIG :—E. Bot. 2011. Hepp Sporen t. 8. f. 56.

EXS :—Hepp 56. Arn. 301. Schær. 183. 341. Anzi 216.

GEOG. DISTRIB :—Bavaria, Hungary, Germany, Switzerland, Italy, Austria, France.

BOT. PROV :—1...5...11...15...31.

ENGLAND :—Durham. *Rev. J. Harriman*. Leather Tor! Dartmoor. *Dr. Holl*. Muggleswick Fell and near Eglestone, Durham. *Mr. Winch*. Middle! Shropshire.

SCOTLAND :—Highlands! *Mr. Dickson*. (1801.) Loch Carron. *Messrs Borrer & Hooker*. Kincardine. *Rev. J. M. Crombie*.

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey*.

*forma smaragdula*, (Whlnb.) *thalline squamulæ plano-convex, dispersed, pallescent (K—C—); apothecia minute, punctiform.*

**On rocks, not uncommon. 1800.**

SYN :—*Endocarpon*, Whlnb! in Ach. Meth. Suppl. 29. (1803.) Ach. Syn. 98. Nyl. Scand. 175.

FIG :—E. Bot. 1512. Leight. Ang. Lich. t. 4. f. 3.

EXS :—Fellm. 138. Leight. 271. 317. Mass. 62. 281. Hepp 175. Schær. 117. Mudd. 132.

GEOG. DISTRIB :—Austria, Norway, Switzerland, Italy, E. Lapland.

BOT. PROV :—1.. 3..7...10, 11...18...31.

ENGLAND :—Near Eglestone! Durham. *Rev. J. Harriman*. (1800.) Mountainous parts of Northumberland and Durham! *Mr. Borrer*. Howden Gill! Ayton Moor; Cleveland. *Mr. Mudd*. Budleigh Salterton, Devon. *Dr. Dickie*. Exeter. *Mr. Parfitt*.

SCOTLAND :—Garrynahine, Lewis. *Dr. Lindsay*.

WALES :—Glandwr, Barmouth! Llandrindod! *Rev. T. Salwey*.

CHANNEL ISLANDS :—La Moie, Jersey. *Mr. Larbalestier*.

*forma sinopica*, (Whlnb.) ferruginous-red, areolato-squamulose, appressed (K—C—); apothecia minute, punctiform, black.

**On rocks in alpine places, not frequent. 1807.**

SYN :—*Endocarpon*, Whlnb! in Ach. Meth. Suppl. 30. (1803.) Ach. Syn. 98. Nyl. Scand. 175.

FIG :—E. Bot. 1776. Leight. Ang. Lich. t. 5. f. 1.

EXS :—Hepp 768. Anzi It. S. 217. Schær. 116.

GEOG. DISTRIB :—Switzerland, Italy, Norway.

BOT. PROV :—7.. 12...15...31.

ENGLAND :—Mungrisedale ! Cumberland. *Mrs. Stanger.*

SCOTLAND :—Aberfeldy ; Ben Lawers. *Mr. H. Marmillan.* Braemar. *Rev. J. M. Crombie.*

WALES :—Anglesea. *Rev. H. Davies.* Bodowen ! Glandwr ! Barmouth. *Rev. T. Salwey.* Aber !

CHANNEL ISLANDS :—Guernsey. *Mr. Larbalestier.*

*forma privigna*, (Ach.) thallus nearly evanescent, *nigropiceous* or dark brown (K—C—) ; *apothecia* scattered, *blackish*, margin *black*, *elevated*, *flexuose*.

On sandstone rocks, not frequent. 1810.

SYN :—Ach. Meth. 49. (1803.) Syn. 151. Nyl. Scand. 175.

FIG :—E. Bot. 2152 ! (two right hand fig).

EXS :—Leight. 196. Mass. 64. Hepp 57. Arn. 185.

GEOG. DISTRIB : Italy, Germany, Switzerland.

BOT. PROV :—1, 2...10, 11...31.

ENGLAND :—Eglestone ! Durham. *Rev. J. Harriman.* (1810.) near Ayton ! Cleveland. *Mr. Mudd.* Rothingdean ! Sussex. *Mr. Borrer.* Lynmouth, N. Devon. *Miss Atwood.* Boxley Hill, Sussex ; New Forest, Hants. *Adm. Jones.* Lyndhurst Moor and Epping Forest ! *Rev. J. M. Crombie.* near Gainford and Gateshead Fell, Durham ; Heaton Dene and near Jesmond, Northumberland. *Mr. Winch.*

CHANNEL ISLANDS :—L'etacq, Jersey. *Mr. Larbalestier.*

*forma simplex*, Dav. nearly *ecrustaceous* (K—C—) *apothecia* small, black, variously *corrugate* or *plicate* ; margin irregularly *crenate* ; spores most minute.

On rocks, not uncommon. 1794.

SYN :—Davies in Linn. Trans. 2. 283. (1794) Nyl. Scand. 176.

FIG :—Linn. Trans. 2. t. 28. f. 2. E. Bot. 2152. two left hand fig.

EXS :—Leight. 272. 273. Anzi Langob. 189. Zw. 143. Mass. 337.

GEOG. DISTRIB :—Italy, Hungary, Germany.

BOT. PROV :—1...5...7...15...19...31.

ENGLAND :—Tintagel ! *Mr. Borrer.* Capstone Hill, Ilfracombe. *Miss Atwood.* Anstey Cove, Torquay. *Mr. Parfitt.* near Buckfastleigh, S. Devon. *Dr. Holl.* Church Stretton ! Shropshire.

SCOTLAND :—Craig Tulloch ; Craig Guie ; Kincardine. *Rev. J. M. Crombie.*

IRELAND :—Near Dunkerron. *Dr. Taylor.*

WALES :—Anglesea ! *Rev. Hugh Davies.* Aberdovey ! *Rev. A. Bloxam.* Barmouth. !

CHANNEL ISLANDS :—La Moye, Jersey. *Mr. Larbalestier.*

6. *L. admissa*, Nyl. dark *fuscous* or *baudio-fuscous*, opaque, *verrucoso-areolate*, areolae somewhat *turgid*, contiguous or distinct, *subrugulose* (K—C—) ; *apothecia* concolorous, minute, one in each of the thalline verrucæ, *epithecium* minute obtusely impressed or somewhat

convex in the centre, thalline margin obtuse; spores numerous, colourless, ellipsoid, simple.

On mountain rocks, rare. 1870.

SYN.—Nylander in Flora 1867. p. 370. Crombie En. 57.

GEOG. DISTRIB :—Europe, Finland.

BOT. PROV :—15.

SCOTLAND :—Kilhoil and Craig Guie, Braemar. *Rev. J. M. Crombie*.

7. *L. fuscata*, (Schrader.) reddish-brown, tartareous, areolato-squamulose, areolae angular, smooth and unpolished or rugged (K—C red); apothecia immersed, concave, dark brown, margin entire, slightly raised; spores numerous, minute, oblongo-ellipsoid, simple.

On rocks and walls, frequent. 1830.

SYN :—Schrader Spic. Germ. 83. (1794.) Nyl. Scand. 175. *Sagedia rufescens*, Ach. Syn. 135. *Endocarpon rufo-virescens*, Tayl. Fl. Hib. 2. 100.

FIG :—E. Bot. Suppl. 2657. Leight. Ang. Lich. t. 4. f. 4.

EXS :—Mudd 131.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1.. 4, 5, 7...10, 11...15...19.. 31.

ENGLAND :—Gorleston! Suffolk. *Mr. Lorrer*. (1830.) Guisbro' Moor! Cleveland. *Mr. Mudd*. Lamorna! Cornwall; Craigfiora! Oswestry. *Rev. T. Salwey*. Great Ayton! *Mr. Dixon*. Northumberland! and Durham! *Mr. Robertson*. Sutton Bank. Flirsk! *Mr. Baker*. Wrekin! Laurence Hill! Nesselcliffe Hill! Haughmond Hill! Lyth Hill! Shropshire.

SCOTLAND :—Ben Lawers. *Rev. J. M. Crombie*.

IRELAND :—Cappaghmore near Dunkerron! *Dr. Taylor*.

WALES :—Barmouth! *Rev. T. Salwey*.

CHANNEL ISLANDS :—L'etacq; La Mole, Jersey. *Mr. Lorbalestier*.

8. *L. Sambuci*, (Pers.) whitish or cinerascens, very thin, effuse, granulose or sub-leprose or almost cranescent (K—); apothecia fuscous or fusco-rufescent, minute, plane, thalline margin white, crenulate; spores 12, 16 or 32, rarely 8, colourless, ellipsoid, simple.

On trees, rare.

SYN :—Persoon in Ust. Ann. Bot. st. 7. 26. (1794.) Nyl. Scand. 168. Crombie Enum. 53.

EXS :—Arn. 300.

GEOG. DISTRIB :—Mid. Europe, Sweden.

BOT. PROV :—28.

IRELAND :—Armagh, *Adm. Jones*.

9. *L. hypophæa*, Nyl. cinerascens or cinereo-virescent, thin, granulato-unequal; apothecia nigricant or sangui-



neo-black, *lecideine*, somewhat plane, marginate, proper margin black, *sub-crenulate* or unequal or *undulate*, then convex and immarginate ; spores numerous, colourless, oblong, simple ; paraphyses moderate or thickish, articulate, apices thicker, electrino-fuscescent ; hypothecium colourless, fuscous-black beneath, and with glomerulose gonidia ; gelatina hymenea at first blue then vinose or fulvous red with iodine.

On granite rocks, very rare. 1869.

SYN :—Nyl. in Flora 1870. p. 34. Crombie in Seem. Journ. Bot.

8. 97.

GEOG. DISTRIB :—Europe.

BOT. PROV :—15.

SCOTLAND :—Near Old Maclur Cathedral, Aberdeen. *Rev. J. M. Crombie*, (1869).

Allied to *privigna* Ach. but distinguished chiefly by its greyish-green granulate thallus, and crenulate or undulate margin of the apothecia. *Crombie*.

### B. Spores 8 simple.

#### \* *Thallus K yellow C red.*

10. *L. sarcopis*, (Whlbb.) *flavido-cinerascent*, granulose, thin, sub effuse ; *apothecia small*, numerous, *carneorufous or sub-rufous*, plane or sub-convex, thalline *margin crenulate* ; spores 8, colourless, ellipsoid, simple ; thallus K yellow C red.

On trees and palings, not common.

SYN :—Wallenberg Suppl. Ach. Meth. 40. (1803.) Ach. Syn. 177. Nyl. Scand. 165.

GEOG. DISTRIB :—Russia, Austria, Hungary, Germany, Lapland, Switzerland.

BOT. PROV :—3...10.

ENGLAND :—Yorkshire. *Mr. Mudl.* Kelvedon, Essex. *Mr. Varrenne*.

11. *L. tartarea*, (L.) white or albo-cinerascent, tartareous, *granulato conglomerate*, rimulose ; *apothecia large*, scattered, disk plane, rugulose, *pallido-testaceous*, thalline margin *thick, inflexed and flexuose* ; spores 8, colourless, elliptico-oblong, simple, large ; *thallus and apothecia K yellow C red.*

On rocks, not uncommon. 1794.

SYN :—Linn. Sp. Pl. ed. 1. No. 14. (1753.) Ach. Syn. 172 Nyl. Scand. 157.

FIG :—E. Bot. 156.

EXS :—Maudon 5. 8. Zw. 324. Schaer. 541. M. & N. 69. Welw. Lusit. 114. Bohl. 10.

GEOG. DISTRIB :—Europe, Africa, America.

BOT. PROV :—1...5...7...10. 11...15...18...(19—30) ..31.

ENGLAND :—Cliff-rigg! High Cliffs! Cleveland. *Mr. Mudd*. Clee Hill! Shropshire. *Rev. T. Salwey*. Yorkshire! *Mr. Dixon*. Harnby and Helmsley, Yorkshire. *Mr. Teesdale*. (1794.) Northumberland and Durham. *Mr. Winch*. Blackstone Rock; Lustleigh Cleve, Devon. *Mr. Parfitt*. Malvern Hills. *Mr. Purton*.

SCOTLAND :—Garrynahine, Lewis; Hills south of Ballater! Aberdeenshire; Abernethy! Perthshire; Birnam Hill! Dunkeld. *Dr. Lindsay*.

IRELAND :—Frequent. *Mr. Carroll*.

WALES :—Barmouth! Conway Mountain! Glyder Vach!

CHANNEL ISLANDS :—Common on all the Islands. *Mr. Lartales-tier*.

*forma grandinosa*, Ach. *verrucoso-granulate*, *verrucæ subglobose glabrous*.

On trees, not common. 1810.

SYN :—Ach. L. U. 372. (1819.) Syn. 172. Nyl. Scand. 157.

EXS :—Spruce Amaz. And. 193. Anzi Langob. 431.

GEOG. DISTRIB :—Europe.

BOT. PROV :—10, 11. 15.

ENGLAND :—Teesdale. *Rev. J. Harriman*. Hobhole near Castleton, Cleveland! *Mr. Mudd*.

SCOTLAND :—Inverary! *Mr. Piggott*.

*forma frigida*, Ach. thallus thin, *papillose*, *ramuloso-spinulose*.

On mosses, not common.

SYN :—Ach. Meth. 166. (1803.) Syn. 172. Nyl. Scand. 157.

FIG :—E. Bot. 1879.

EXS :—Fellman 114. Anzi Langob. 101. Th. M. Fries 61.

GEOG. DISTRIB :—N. Europe, N. America.

BOT. PROV :—11...15.

ENGLAND :—Northumberland and Durham. *Mr. Winch*.

SCOTLAND :—Hills above Blair in Athol. *Mr. Don*. Lofty Hills. *Mr. Dickson*. Grampians. *Rev. J. M. Crombie*.

The form *gonatodes*, Ach. (Fellm. 115. Anzi It. S. 166.) has the same reaction and appears to be only a more crustaceous state growing on mosses “*crusta ramulosa, ramis divaricatis tortuosis gibbosis lobato-verrucosis difformibus*,” most probably it may be found in our alpine localities.

12. *L. parella*, (L.) *whitish* or *albido-cinerascent*, *granulato-rugose* or *verrucoso-granulate* or *rimoso-diffract*; apothecia numerous, crowded, *anguloso-difformed*, disk plane, dusky testaceous, coarsely albo-granulate, often verrucose; margin thick, often *radiato-crenulate*;

spores 6-8, colourless, ellipsoid, simple, large; *thallus* *K* yellow *C* yellow, the disk of apothecia alone becoming red.

On rocks, frequent.

SYN:—Linn. Mantissa 1. p. 132. (1767.) Ach. Syn. 159. Nyl. Scand. 156.

FIG:—E. Bot. 727. Hepp Sporen. t. 71. f. 622.

EXS:—Maudon 56. Anzi It. S. 164. M. & N. 1145. Zw. 66. Larbal. 75.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1...5...7...10, 11.. 15 ..18...(19—30.) 31.

ENGLAND:—Ayton! *Mr. Mudd.* Whitestone Cliff! near Thirsk. *Mr. Baker.* Beechy Head! *Dr. Hooker.* Durham; Fern Islands, Northumberland, *Mr. Winch.* Devon. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.* Bedfordshire. *Rev. C. Abbot.* Studley Castle, Warwickshire; Malvern Hills. *Mr. Purton.* Nesscliffe Hill! Bodbury Ring near Church Stretton! Haughmond Hill! Llanymynech Hill! Caer Caradoc! Shropshire.

SCOTLAND:—Stennis, Orkney. *Dr. Lindsay.* Long Island. *Prof. Balfour.* coast of Kincardine; Morrone; Craig Tulloch, *Rev. J. M. Crombie.*

IRELAND:—Common. *Mr. Carroll.*

WALES:—Aberdovey! *Rev. A. Bloxam.* Barmouth! Diganwy near Conway!

CHANNEL ISLANDS:—Jersey! and all the other Islands. *Mr. Larbalestier.*

forma *pallescent*, (L.) white, disk of apothecia albo-pruinose, margin thick, entire, smooth.

On rocks and trees, frequent.

SYN:—Linn. Sp. Pl. ed. 1. No 15. (1753.) Ach. Syn. 169. Nyl. Scand. 1857.

EXS:—Maud. 3. Schær. 570. Nyl. 38. Anzi Etr. 16. Larbal. 76.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1, 2...4, 5...7...15...25...31.

ENGLAND:—Countess Weir Bridge, Devon. *Mr. Parfitt.* near Kingsbridge, S. Devon; Ventnor, Isle of Wight. *Dr. Holl.* Midland Counties. *Mr. Purton.* Bedfordshire. *Rev. C. Abbot.*

SCOTLAND:—Aberfeldy! *Dr. Holl.* Long Island. *Prof. Balfour.* Coast of Kincardine. *Rev. J. M. Crombie.*

IRELAND:—Killaloe and Muckruss. *Mr. Carroll.*

WALES:—Between Bala and Dolgelley!

CHANNEL ISLANDS:—St. Lawrence, Jersey! and all the other Islands. *Mr. Larbalestier.*

forma *tumidula*, (Pers.) whitish, disk of apothecia carneo-testaceous, coarsely albo-granulate, margin thick, entire or crenate, smooth.

On trees, not common. 1861.

SYN:—Persoon in Ust. Ann. Bot. st. 11. p. 18. Ach. Syn. 170. Mudd Man. 155.

FIG:—Hepp Sporen t. 21. f. 188.

EXS:—Hepp 188. 784. Mudd 126. Korb. 275. Anzi Langob. 100. Arn. 140. Maudon 9. Anzi. It. S. 165. Schær. 317. 318. Welw. Lusit. 88. Bohl. 60. M. & N. 1146.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1, 2, 3...10...15.

ENGLAND:—Near Easby!; near Ayton! Cleveland. *Mr. Mudd.* Haldon; Exmouth, Devon. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.* near Shanklin, Isle of Wight. *Dr. Holl.*

SCOTLAND:—Braemar. *Rev. J. M. Crombie.*

forma *Turneri*, (Sm.) *albo-sorediate*; margin of apothecia thick, entire, *albo-pulverulent* or *sorediose*.

On trees, not common. 1801.

SYN:—Smith in E. Bot. 857. (1801.) Ach. Syn. 170.

FIG:—E. Bot. 857.

EXS:—Mudd 127. Leight. 237.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1, 2, 3...10, 11...15...19...25.

ENGLAND:—Near Ayton! Newton Wood! Airyholme! Cleveland. *Mr. Mudd.* Northumberland and Durham. *Mr. Winch.* Kelvedon, Essex. *Mr. Varenne.* near Shanklin; near Totness. *Dr. Holl.* near Exeter. *Rev. J. M. Crombie.*

SCOTLAND:—Castleton of Braemar. *Rev. J. M. Crombie.*

IRELAND:—Muckruss demesne. *Adm. Jones.* Deer Park, Castlemartyr; Killarney. *Mr. Carroll.*

13. *L. poriniiformis*, Nyl. *cinereous* or *pallido-cinereous*, firm, thin, *rimoso-diffract*; apothecia 1-3-4, *innate in convex verrucæ*, (externally like a *Pertusaria*) *disk pale, punctiformi-contracted*; spores 6-8, colourless, ellipsoid, simple; K yellow C the verrucæ and disk brownish red:

On micaceous-schistose mountain-rocks, rare. 1865.

SYN:—Nyl. in Flora 1865. p. 353. Crombie En. 56.

GEOG. DISTRIB:—Europe.

BOT. PROV:—15.

SCOTLAND:—Ben Lawers! *Adm. Jones.* (1865.) Portlethen! Kincardine. *Rev. J. M. Crombie.*

14. *L. rupestris*, (Scop.) *whitish* or dark *cinereous*, thin and effuse, or tartareous, *furfuraceous*, *rinuloso-areolate*; apothecia *dull orange*, immersed, plane and margined, or emersed, convex, immarginate; spores 8, colourless, ellipsoideo-oblong, simple; apothecia K red.

On calcareous rocks, common.

forma *incrustans*, (DC.) *white, thin, effuse* ; apothecia *small, immersed, plane, margined*.

SYN :—De Candolle Fl. Fr. 2. 361. (1805.) Schær. En. 146.

EXS :—M. & N. 944. upper spec. Schær. 220. Mass. 320.

GEOG. DISTRIB :—Europe, N. Zealand.

BOT. PROV. :—1.. 5 ..10.

ENGLAND :—Yorkshire ! *Mr. G. Dixon*. Chudleigh Rocks ; Ansteys Cove, Torquay. *Mr. Parfitt*. Whitecliffe Rocks ! Ludlow.

forma *calva*, (Dicks.) *white, thin, effuse* ; apothecia *large, emersed, convex, immarginate*.

On calcareous rocks, frequent. 1790.

SYN :—Dickson Crypt. 2. 18. (1790.) Ach. Syn. 39. Nyl. Scand. 147.

FIG :—E. Bot. 948. Dicks. Cr. t. 6. f. 4. Hepp Sporen t. 16. f. 134.

EXS :—Schær. 221. Hepp 134. Mass. 321. M. & N. 944. lower central spec.

GEOG. DISTRIB :—Europe.

BOT. PROV :—3...5...15...19.

ENGLAND :—Craig-y-Rhiw, Oswestry, ! *Rev. T. Salwey*. Shotover Hill, Oxford. *Mr. Baxter*. Oversley Green Bridge ; Coughton Court, Warwickshire. *Mr. Purton*. Whitecliffe Rocks, ! Ludlow ; Llanymynech Hill ! Shropshire.

SCOTLAND :—Highlands. *Mr. Dickson*. (1790).

IRELAND :—Cork ! *Mr. Carroll*.

forma *rufescens*, (Hffm.) *nigricanti-cinereous, tartareous, furfuraceous, rimuloso-areolate* ; apothecia *large, convex, immarginate*.

On calcareous rocks.

SYN :—Hoffm. Pl. Lich. 1. 80. (1790.) Schær. En. 146.

FIG :—Hoffm. Pl. Lich. t. 17. f. 1. Hepp Sporen t. 3. f. 7.

EXS :—Hepp 7. Mass. 322. Mudd 161. M. & N. 944. right and left spec.

GEOG. DISTRIB :—Europe.

BOT. PROV :—5...10.

ENGLAND :—Carlton ! Newton Wood ! Cleveland. *Mr. Mudd*. Wenlock ! ; Steeraway lime rocks ! Shropshire.

forma *viridifluvescens*, (Wulf.) *albido-cinereous, tartareous, rimuloso-areolate* ; apothecia *large or small, yellowish or orange, subimate or emersed, immarginate*.

SYN :—Wulf. in Jacq. Coll. 3. 101. (1789.) Schær. En. 146.

FIG :—Jacq. Coll. 3. t. 2. f. 1.

EXS :—Leight. 119.

GEOG. DISTRIB :—Europe.

BOT. PROV :—5...10...19.

ENGLAND :—Yorkshire. *Mr. Mudd*. Whitecliff rocks near Ludlow !

IRELAND :—Whitepoint ! Cork. *Mr. Carroll*.



**\*\* *Thallus K yellow C yellow.***

15. *L. Upsaliensis*, (L.) *albo-glaucescens*, thin, membranaceous, smooth; apothecia numerous, at first *globosoverrucose*, disk at length *dilated, plane, pallido-lutescent, coarsely granulate*, margin thick, tumid, elevated, incurved, smooth; spores 8, colourless, ellipsoid, simple, large; *thallus and disk of apothecia K y. C y.*

On mosses &c. rare. 1782.

SYN:—Linn. Sp. Pl. ed. 1. No. 17. (1753.) Ach. Syn. 169. Nyl. Scand. 157.

FIG:—E. Bot. 1634. Hepp Sporen t. 71. f. 623.

EXS:—M. & N. 1147. Hepp 623. Schær. 316.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1...4...15.

ENGLAND:—Near Norwich. *Rev. H. Bryant.* (1782.) near Sprowston. *Messrs Turner & Leathes.*

SCOTLAND:—Braemar. *Rev. J. M. Crombie.*

16. *L. varia*, (Ehrh.) *greenish yellow or straw-coloured, granulose* or *granulato-unequal*, sub-determinate, thin; *apothecia concolorous* or *flavo-pallescent* or *livido-virescent*, *thalline margin entire* or *sub-entire*; spores 8, colourless, ellipsoid, simple; *thallus K yellow C yellow.*

On trees, palings, &c. common. 1801.

SYN:—Ehrh. Crypt. No. 68. (1785.) Ach. Syn. 161. Nyl. Scand. 163.

FIG:—E. Bot. 1666. Hoffm. Pl. L. t. 23. f. 4. Hepp Sporen t. 21. f. 190.

EXS:—M. & N. 840. Schær. 325. Hepp 190. Anzi It. S. 173. Bohl, 107. Fellm. 133.

GEOG. DISTRIB:—Europe, Africa, N. America. N. Zealand.

BOT. PROV:—3, 4, 5...7...10, 11...(19—30)...31.

ENGLAND:—Burgh Castle near Yarmouth. *Mr. Turner.* Battersby! Cleveland. *Mr. Mudd.* Northumberland and Durham. *Mr. Winch.* Kelvedon, Essex. *Mr. Varenne.* Ragley Park pales, Warwickshire. *Rev. W. S. Rufford.* near Wetheley, Warwickshire. *Mr. Purton.* Monkmoor! Loppington! Berwick! &c., Shropshire.

IRELAND:—Frequent. *Mr. Carroll.*

WALES:—Barmouth!

CHANNEL ISLANDS:—Common on all the Islands. *Mr. Larbalettier.*

Var. *aitema*, (Ach.) *yellow, leprose*; apothecia *black, lecideine*, convex, small, whitish within; spores oblong, simple.

On trees, not common.

SYN:—Ach. L. U. 178. (1810.) Syn. 24. Nyl. Scand. 163.

FIG:—Hepp Sporen t. 9. f. 69.

EXS:—Hepp 69. Anzi It. S. 177.

GEOG. DISTRIB:—Sweden, Switzerland, Italy.

BOT. PROV:—1...3...19.

ENGLAND:—Exminster Marshes, Devon. *Mr. Parfitt*. Kelvedon, Essex. *Mr. Varenne*.

IRELAND:—Glanmire and Great Island, Cork. *Mr. Carroll*.

Var. *symmicta*, (Ach.) *flavo-albicant*, thin; apothecia *pale* or *pale testaceous* or *pale yellow*, *biatorine*.

On trees and palings, frequent.

SYN:—Ach. L. U. 379. (1810) Syn. 36. Nyl. Scand. 163.

FIG:—Hepp Sporen t. 9. f. 68.

EXS:—Fellm. 132. Anzi It. S. 174. Zw. 341. Mudd 117. Hepp 68. Fries 45.

GEOG. DISTRIB:—Scandinavia, New Zealand, Arctic America, Algeria, Sweden, Switzerland, Hungary.

BOT. PROV:—2, 3. 5...8...10.. 31.

ENGLAND:—Gopsall! Leicestershire. *Rev. A. Bloxam*. Ayton! Cleveland. *Mr. Mudd*. Kelvedon, Essex. *Mr. Varenne*. Epping Forest. *Rev. J. M. Crombie*. Loppington! Montford Bridge! Middleton! Shropshire.

CHANNEL ISLANDS:—St. John's, Jersey. *Mr. Larbalestier*.

Var. *scapincola*, (Ach.) *yellow*, *granulose* or *granuloso-unequal*; apothecia *dark rufescent* or *black*, more or less *immersed*, convex, *biatorino-lecideine*; spores *oblong*, *simple* or *slightly 1-septate*.

On old palings &c. frequent.

SYN:—Ach. Syn. 35. (1817.) Nyl. Scand. 164.

FIG:—Hepp Sporen t. 21. f. 192.

EXS:—Mudd 118. Hepp 192. Zw. 116. Schaer. 619. Anzi Langob. 303.

GEOG. DISTRIB:—Sweden, E. Lapland, Germany, Switzerland, Italy, Lombardy.

BOT. PROV:—10.

ENGLAND:—Near Battersby, ! Cleveland. *Mr. Mudd*.

Var. *terrestris*, Nyl. *terricole*.

On mosses in alpine localities.

SYN:—Crombie Enum. 52. (1870).

GEOG. DISTRIB:—Europe.

BOT. PROV:—15.

SCOTLAND:—Ben Lawers and Ben-na-boord. *Rev. J. M. Crombie*.

Var. *conizæa*, (Ach.) *albido-flavescens*, *finely granulated-pulverulent*; apothecia *pale* or *carneo-pallid*, thalline *margin pulverulent*.

On old palings and trees, not common. 1790.

SYN :—Ach. L. U. 374. (1810.) Nyl. Scand. 163.

FIG :—E. Bot. 1549.

EXS :—Leight. 378.

GEOG. DISTRIB :—Scandinavia, France, Switzerland.

BOT. PROV :—4, 5.. 8 ..10.. 19...30.

ENGLAND :—Norfolk. *Mr. Turner*. Ripon, Yorkshire. *Mr. Brunton*. near Twycross, Leicestershire. *Rev. A. Bloxam*. Stableford! near Bridgnorth, Shropshire.

SCOTLAND :—Derryquin. *Dr. Taylor*. Glenarm. *Dr. Moore*.

17. *L. atra*, (Huds.) *whitish* or *albido-cinereous*, *granulose*, or *granulato-unequal*; *apothecia black*, *internally nigricant*, thalline margin entire, flexuose or subcrenulate; spores 8, colourless, ellipsoid, simple; *section of apothecium K black*, thallus K yellow C yellow.

On rocks and trees, frequent. 1762.

SYN :—Huds. Fl. Angl. ed. 1. 445. (1762,) Ach. Syn, 143. Nyl. Scand. 170.

FIG :—E. Bot. 949. Hepp Sporen t. 20. f. 182. and t. 70. f. 613.

EXS :—Hepp 613. 182. Breutel 401. Fellm. 140. Zw. 63. Anzi It. S. 168. 189.

GEOG. DISTRIB :—Europe generally, Italy, Switzerland, Hungary, E. Lapland, Sweden, Tyrol Alps, Algeria.

BOT. PROV :—1...3, 4, 5...10, 11...15...18...(19—30)...31.

ENGLAND :—Airyholme Wood! Cleveland. *Mr. Mudd*. Northumberland and Durham. *Mr. Winch*. Kelvedon, Essex. *Mr. Varenne*. Croyde Bay, N. Devon. *Mr. Parfitt*. Midland Counties. *Mr. Purton*. Cambridge. *Rev. R. Relhan*. Oxford. *Dr. Sibthorp*. Bedfordshire. *Rev. C. Abbot*. Pontesford Hill! Abdon! Shropshire! Stannor Hill! Herefordshire.

SCOTLAND :—Kinnoul Hill! Birnam Hill, Callernish and Garynahine, Lewis; Stennis, Orkney. *Dr. Lindsay*.

IRELAND :—Common. *Mr. Carroll*.

WALES :—Between Corwen and Bala! Borth!

CHANNEL ISLANDS :—Jersey! and all the other Islands. *Mr. Lerbalestier*.

Attention to the internal *nigricant* colour of the apothecium and its chemical reaction with K will prevent confusion with *L. subfusca* var. *coilocarpa* which it externally resembles, but in which the internal colour of the apothecium is pale and has chemical reaction K reddish, and also with *L. argopholis* in which the thallus has a yellowish tinge, and is squamuloso-granulose and the apothecia are fusco-nigrescent. How far *L. argopholis* is really distinct from *L. subfusca* may be questioned.

18. *L. leucophava*, (Flk.) *pallido-cinereous*, tartareous, *disperso-verrucoso-arcolate*, arcolae tumid, hypothallus black; apothecia appressed or sub-innate, *livido-fuscous*,

plane, frequently congregated, margin thin, *fuscuscent*, ultimately excluded; *hypothecium pale*; spores 8, colourless, ellipsoid, simple; thallus K faint yellow, C faint yellow.

On sub-alpine rocks, not common. 1866.

SYN:—Korb. S. L. G. 194. (1855.) Leight. Not. Lich. No. xv. (1866.) Crombie Enum. 51.

GEOG. DISTRIB:—Europe.

BOT. PROV:—7...15.

SCOTLAND:—Kincardine. *Rev. J. M. Crombie*.

WALES:—Llyn Aran! Mynydd-y-Gader! and generally and abundantly on north escarpment! and also in Llyn Cae! on the south side of Cader Idris! (1866).

19. *L. circinata*, (Pers.) *cinerascens* or cinerous-white, orbicular, *adnate*, *verrucoso-areolato-diffract* in the centre, *radioso-uciniate* at the circumference, *laciniæ narrow*, *plano-convex*, *contiguous*, incised and crenate at the apices, upper surface *minutely albo-depresso-granulate*; apothecia *innate*, sub-urceolate or plane, fuscous-black, margin entire; spores 8, colourless, ellipsoid, simple; thallus K yellow C yellow.

On limestone rocks, rare. 1783.

SYN:—Persoon in Ust. Ann. Bot. st. 7. p. 25. (1794.) Ach. Syn. 184. Nyl. Scand. 152.

FIG:—E. Bot. 1941. Hepp Sporen t. 89. f. 777. Relh. Fl. Cantab. 427. t. 6.

EXS:—Nyl. 118. M. & N. 457. Zw. 189. Schær. 328. Hepp 777. Anzi It. S. 163.

GEOG. DISTRIB:—Europe, Asia, Africa.

BOT. PROV:—4, 5...8...11, 12...15.. 31.

ENGLAND:—On Clare Hall Bridge, Cambridge; Grantchester Churchyard Wall. *Rev. R. Relhan*. (1783.) Kirkby Lonsdale, Westmoreland. *Sir J. E. Smith*. Bury. *Rev. G. R. Leathes*. Hale End! Malvern. *Dr. Holl*. Barnard Castle, Durham. *Rev. J. Harri-man*. Canal Bridge near Congerstone, Leicestershire. *Rev. A. Blouin*. Pophills; Oversley Bridge, Warwickshire. *Mr. Purton*.

SCOTLAND:—Cathkin. *Mr. Hopkirk*. Clova. *Mr. Don*.

CHANNEL ISLANDS:—Guernsey. *Rev. T. Salwey*.

20. *L. cinerea*, (L.) *cinereous* or *albido-cinerascens*, *areolato-diffract*, hypothallus nigricant; apothecia black, *immersed*, *plane*, *thalline margin entire*; spores 8, colourless, ellipsoid or sometimes subglobose, simple; *thallus K yellow, C yellow or reddish*.

On rocks, frequent.

SYN :—Linn. Mant. 1. p. 132. (1767.) Ach. Syn. 140. Nyl. Scand. 153.

FIG :—E. Bot. 1751.

EXS :—Fellm. 117. 118. 121. Leight. 204. Anzi It. S. 207. 72. 24. 208. Schar. 125. 126. 127. 130. 620. Mass. 270. Korb. 246. Hepp 625. Arn. 116. Zw. 4. Fries 343.

GEOG. DISTRIB :—E. Lapland, Russia, Italy, Hungary, Switzerland, Norway, Pyrenees, Sweden, Arctic America.

BOT. PROV :—1, 2, 3...5...7...10, 11...15...18, (19—30).. 31.

ENGLAND :—Sussex. *Mr. Borrer*. Kildale ! Cliffrigg ! *Mr. Mudd*. near Eglestone ; Boldon and Cleadon, Durham. *Mr. Winch*. Bishopton, Torquay. *Mr. Parfitt*. Coggeshall, Essex. *Mr. Varnne*. Oakham Dingle ! near Church Stretton, Shropshire ; Stannor Hill ! Herefordshire.

SCOTLAND :—Garrynahine, Lewis ; Stennis, Orkney. *Dr. Lindsay*. Ben Lawers ; Braemar. *Rev. J. M. Crombie*.

IRELAND :—Common. *Mr. Carroll*.

WALES :—Pen-maen-mawr ! Barmouth ! Aberdovey ! Aber ! Cader Idris ! Crib Goch ! Snowdon !

CHANNEL ISLANDS :—Noirmont ! Jersey ; Guernsey. *Mr. Laroche*.

21. *L. frustulosa*, (Dicks.) *albido-flavescent*, thick, tartareous, verrucoso-areolate or disperso-glebulose, glebulæ sub-radiato-lobate, smooth ; apothecia numerous, sessile, fuscous-black, plane or sub-convex, thalline margin thick, entire or sub-crenate ; spores 8, colourless, oblongo-ellipsoid, simple ; thallus K yellow C yellow.

On alpine rocks, rare. 1793.

SYN :—Dicks. Crypt. 3, 13. (1793.) Nyl. Scand. 166.

FIG :—E. Bot. 2273.

EXS :—Leight. 293.

GEOG. DISTRIB :—Norway, Sweden, Silesia.

BOT. PROV :—7. 15.

SCOTLAND :—Breadalbane ! *Mr. Borrer*. Yorkshire. *Mr. Dickson*. Ben Lawers ! *Rev. H. Macmillan*.

WALES :—Arthur's Table, Anglesea. *Rev. A. Bloxam*.

22. *L. argopholis*, (Whlbb.) *whitish* or *albido-stramineous*, verrucoso-granulose, firm, granules imbricate, rotundato-lobate ; apothecia fusco-nigrescent, thalline margin entire or crenate ; spores 8, colourless, oblongo-ellipsoid, simple ; thallus K yellow C yellow.

On alpine rocks, rare.

SYN :—Wahlenberg in Ach. Meth. Suppl. 32. (1803.) Ach. Syn. 147. Nyl. Scand. 166.

FIG :—Hepp Sporen t. 20. f. 178.

EXS :—Fellm. 131.



GEOG. DISTRIB :—E. Lapland, Norway, E. Finland, Italy, Switzerland.

BOT. PROV :—7...14, 15.

SCOTLAND :—Near Edinburgh. *Mr. Maughan*. Ben Lawers. *Rev. J. M. Crombie*.

WALES :—Llyn Cae ! Cader Idris ; Moel-y-Golfa ! Montgomeryshire.

23. *L. polytropa*, (Ehrh.) *pallido-sulphureous*, tartareous, *granulato-areolate*, *diffract*, often diffuse and subevanescent ; apothecia *pale yellowish flesh-coloured*, plane or convex, *innato-sessile*, *margin concolorous*, thickish, *flexuose*, eventually obliterated ; spores 8, colourless, ellipsoid, simple ; thallus K pale yellow C deeper yellow.

On alpine rocks &c. frequent. 1782.

SYN :—Ehrhart Crypt. No. 294. (1793.) Ach. Syn. 47. Nyl. Scand. 164.

FIG :—E. Bot. 1264. two lower fig. Hoffm. Pl. Lich. t. 58 f. 2. Hepp Sporen t. 8. f. 67.

EXS :—M. & N. 748. Schær. 321. Hepp 67. Anzi It. S. 200. Leight. 179.

GEOG. DISTRIB :—Sweden, Germany, Switzerland, Italy, Hungary, Norway.

BOT. PROV :—1, 2...5...10, 11...13...15.. 18, 19.. 31.

ENGLAND :—Durham. *Rev. J. Harriman*. Lonsdale ! Cleveland. *Mr. Mudd*. Eridge, ! Ashington Common ! Sussex. *Mr. Borrer*. Torquay ! Dr. *Deakin*. Nesselcliffe Hill ! Shropshire.

SCOTLAND :—Mountains of Breadalbane. *Rev. M. Stuart*. (1782.) Moors of Dumfriesshire. *Mr. Burgess*. Garrynahine, Lewis ; Stennis, Orkney. *Dr. Lindsay*.

IRELAND :—Blackwater Hill ! co. Kerry. *Dr. Taylor*.

CHANNEL ISLANDS :—Noirmont, Jersey. *Mr. Lorbalestier*. Guernsey. *Rev. T. Salwey*.

forma *conglobata*, (Smurf.) thallus granulato-rugulose, rimose, greenish-yellow ; apothecia *very numerous*, crowded yet distinct, *flavido-ochraceous*, convex, deformed and tuberculate, margin obliterated.

On alpine rocks, frequent.

SYN :—Sommerfelt Fl. Lapp. 83. (1826.) Nyl. Syn. 164.

EXS :—Mudd 120.

GEOG. DISTRIB :—Lapland, Switzerland.

BOT. PROV :—5...7...10.

ENGLAND :—Guisbro' Moor ! Ayton ! Cleveland. *Mr. Mudd*. Yorkshire ! *Mr. Dixon*. Mynydd-y-Myfyr ! near Oswestry. *Rev. T. Salwey*.

WALES :—Barmouth ! *Rev. T. Salwey*.

forma *alpigena*, (Ach.) *pallido-lutescent*, tartareous,

*rimoso-areolate, smooth; apothecia concolorous, large, appressed, plane, thalline margin paler, elevated, persistent, flexuose.*

On alpine rocks, frequent. 1861.

SYN :—Ach. L. U. 379. (1810.) Syn. 170 Mudd Man. 152.

FIG :—Hepp Sporen t. 103. f. 903.

EXS :—Hepp 902. 903. Anzi It. S. 201. 202. Schær. 322.

GEOG. DISTRIB :—Switzerland, Italy.

BOT. PROV :—10...15.

ENGLAND :—Baysdale Moor, Cleveland. *Mr. Mudd.*

SCOTLAND :—Ben Nevis. *Adm. Jones.* Ben Lawers. *Dr. Holl.*

*forma illusoria, Ach. thallus evanescent; apothecia dispersed, large, plano-convex, pale yellow, margin almost obliterated.*

On alpine rocks, rare.

SYN :—Ach. L. U. 380. (1810.) Nyl. Scand. 164. Crombie En. 52.

EXS :—Schær. 323.

BOT. PROV :—7...15.

GEOG. DISTRIB :—Switzerland, Norway.

SCOTLAND :—Mountains frequent. *Rev. J. M. Crombie.*

WALES :—Wyddy-fa, Snowdon ! *Mr. Baker.*

24. *L. intricata*, (Schr.) *sulphureo-virescent, squamoso-areolate, diffract, opaque, areolæ minutely rugose, subcrenulate; apothecia adnate, plano-convex, nigro-fuscous, thalline margin pale, entire, generally obliterated; spores 8, colourless, ellipsoid, simple; thallus K faint yellow C bright yellow.*

On alpine rocks, frequent,

SYN :—Schrader Journ. Bot. 1801. st. 1. p. 72. Ach. Syn. 154. Nyl. Scand. 164.

EXS :—Leight. 153. Arn. 56. Mudd 119.

GEOG. DISTRIB :—Hercynia, Silesia, Lapland, Westphalia, Bavaria.

BOT. PROV :—1...5 ..7...10...19.

ENGLAND :—Ayton Moor ! Kildale Moor ! Battersby ! Cleveland. *Mr. Mudd.* Babbicombe, Devon. *Mr. Parfitt.* Bodbury Ring ! near Church Stretton.

IRELAND :—Kilceanagh co. Kerry. *Dr. Taylor.*

WALES :—Sychnant ! near Conway. Barmouth !

25. *L. sulphurea*, (Hoffm.) *sulphureo-virescent, thickish, tartarcous, rimoso-areolate, smooth; apothecia livid-nigricant, biatorine, convex, deformed, subpruinose, margin obliterated; spores 8, colourless, ellipsoid, simple; thallus K yellow C orange yellow.*

On sub-alpine rocks, walls, tiling, &c. frequent.

SYN :—Hoffm. En. 32. (1784.) Ach. Syn. 37. Nyl. Scand. 165.

FIG :—E. Bot. 1186. Hoffm. Pl. L. t. 11. f. 3. Hepp Sporen t. 21. f. 189.

EXS :—Zw. 3. Schaer. 324. Hepp 189. Arn. 188. Mudd 121. Bohl. 117.

GEOG. DISTRIB :—Sweden, Germany, Switzerland, Scandinavia.

BOT. PROV :—2...5 ..7...10...15 . 18, 19...23, 24...30, 31.

ENGLAND :—Cliffrigg! Lonsdale! Roseberry! *Mr. Mudd.* Sussex! *Mr. Borrer.* Malvern Hills; Black Mountain, Monmouthshire. *Dr. Holl.* Coughton Church, Warwickshire. *Mr. Purton.* Stannor Hill! Herefordshire; Bodbury Ring! near Church Stretton, Caer Caradoc! Stiperstones Hill! Shropshire.

SCOTLAND :—Kincardine. *Rev. J. M. Crombie.* Garrynahine, Lewis; Stennis, Orkney. *Dr. Lindsay.*

IRELAND :—Pigeon Island near Kinnare. *Dr. Taylor.* near Belfast. *Mr. Templeton.* Glenarm. *Dr. Moore.* Killiney near Dublin. *Adm. Jones.* Glengariff, Cork, Kilkee and Ross, Clare, Mangerton, Kerry. *Mr. Carroll.*

WALES :—Diganwy! near Conway.

CHANNEL ISLANDS :—Jersey; Guernsey. *Mr. Larbalestier.*

26. *L. orosthea*, (Ach.) *flavicanti-sulphureous*, thin, *areolato-rimulose*, unequal, sub-pulverulent; *apothecia sub-concolorous*, *flavido-carneous*, *convex*, or *tuberculoso-deformed*, *subpruinose*; spores 8, colourless, ellipsoid or oblong, simple; thallus K yellow C orange yellow.

On sub-alpine rocks.

SYN :—Ach. Prodr. 38. (1798.) Syn. 37. Nyl. Scand. 165.

EXS :—Anzi It. S. 204. 205.

GEOG. DISTRIB :—Switzerland, Germany, Sweden, Scandinavia, Italy.

BOT. PROV :—1...5...7.

ENGLAND :—Bolt Head, S. Devon. *Dr. Holl.* Long Mynd! near Church Stretton, Shropshire.

WALES :—Cwm Bychan! *Rev. T. Salwey.* Aberdovey! *Rev. A. Bloam.*

27. *L. expallens*, Ach. *pallido-sulphureous*, tartareous, *granulate*, *diffract*, often *pulverulent* or *furfuraceous*; *apothecia pallido-carneous*, innate, plano-convex, deformed, thalline margin concolorous, thin, sub-entire, eventually obliterated; apothecia 8, colourless, ellipsoid, simple; thallus K yellow C reddish orange.

On old trees and palings, not common.

SYN :—a. Ach. L. U. 374. (1810.) Syn. 171.

GEOG. DISTRIB :—France.

BOT. PROV :—2...5...7.

ENGLAND :—Sussex. *Mr. Borrer*. Wood opposite the Lodge near Ludlow, Herefordshire ! *Rev. T. Salwey*. Sharpstones Hill ! Shropshire.

WALES :—Trees base of Craig Breidden ! Montgomeryshire.

\*\*\* *Thallus K yellow C*—.

28. *L. oculata*, (Dicks.) *white* or *albo-cinerascent*, *dactylino-papillate*, glabrous ; apothecia at first *innate* in the apices of the papillæ, ultimately expanded, *sub-concave*, black, thalline margin thick, *inflexed*, entire ; spores 8, colourless, ellipsoid, simple ; thallus K yellow C—.

On mosses in alpine localities, rare. 1790.

SYN :—Dicks. Crypt. 2. 17. (1790.) Ach. Syn. 148. Nyl. Scand. 156. *L. dactyliferus*, Whlnbg ! Lapp. 414.

FIG :—Dicks. Crypt. t. 6. f. 3. E. Bot. 1833.

EXS :—Th. M. Fr. 34. Rabh. 776. Fellm. 116.

GEOG. DISTRIB :—Norway, E. Lapland.

BOT. PROV :—3.. 15.

ENGLAND :—Cawley rock, Exeter. *Mr. Parfitt*.

SCOTLAND :—Scotch Alps. *Mr. Dickson*. (1790.) Ben Lawers. *Messrs Turner & Hooker*. Cairngorm ; Braeriach and Bennaboord. *Adm. Jones & Rev. J. M. Crombie*.

29. *L. subfusca*, (L.) *whitish* or *cinerascent*, more or less determinate, thin, *smooth*, *rimulose*, *granulate*, *verrucose*, *rugose* or *diffract*, hypothallus white ; apothecia *fuscous* or *fusco-pallescent* or *nearly black*, often pruinose. plano-convex, *margin* persistent, *entire* or *crenulate* ; spores 8, colourless, ellipsoid, simple ; thallus K yellow C—.

*Forma allophana*, Ach. whitish or albido-cinerascent, determinate or sub-determinate, thin, *unequal*, *rugose* or *granulato-corrugate* ; apothecia plane or convex, rufo-fuscous, sub-rubricosso-fuscous, fuscous-black or black, thalline *margin*, at first *entire*, then *crenate and flexuose* ; *paraphyses slender, not distinct*.

On trees.

SYN :—Ach. L. U. 395. (1810.) Syn. 158 Nyl. Scand. 160. Stizenberg in Bot. Zeit.

FIG :—E. Bot. 2109. Hepp Sporen t. 20. f. 183.

EXS :—Leight. 115. Anzi H. S. 184. Schær. 308. Spruce Amaz. 190. Bohl. 35. Maudon 53. Hepp 183.

GEOG. DISTRIB :—Throughout the World.

BOT. PROV :—1...3, 4, 5...10, 11...15...17...(19—30) 31.

ENGLAND :—Airyholme Wood ! Cleveland, *Mr. Mudd*. Oswestry ! *Rev. T. Salwey*. Northumberland and Durham. *Mr. Winch*. Devon. *Mr. Parfitt*. Kelvedon, Essex. *Mr. Varenne*. Midland Counties. *Mr. Purton*. Bedfordshire. *Rev. C. Abbot*. Wrekin ! Haughmond Hill ! Shropshire.

SCOTLAND :—Balthayock Woods ! Perth. *Dr. Lindsay*. Long Island. *Prof. Balfour*.

CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier*.

Forma *Parisiensis*, Nyl. cinereous, rugose or rugoso-granulate or sub-verrucose, determinate, hypothallus not visible ; *apothecia black or fuscous-black* or rarely fuscous, naked, sometimes slightly cæsiopruinose, moderate, nearly plane, *thalline margin rugose or sub-crenate* ; spores 8, ellipsoid ; *paraphyses distinctly articulate*, slightly incrassate and broadly fuscescent at the apices ; gelatina hymenea blue with iodine.

On trees, rare.

SYM :—Nyl. Luxemb. Lich. in Bull. Soc. Bot. Franc. 13. p. 368. (1866)

EXS :—Rabh. 802.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2.

ENGLAND :—Near Shanklin, Isle of Wight. *Dr. Holl*.

Forma *rugosa*, (Pers.) whitish or darker, determinate, often limited, *granulato-rugose* ; *apothecia elevated, thick, rugose, or rugoso-crenate* ; *paraphyses crowded*.

On trees.

SYN :—*horiza*, Ach. L. U. 394. p. p. (1810.) Syn. 157. Nyl. Scand. 160. Stiznb. l. c.

EXS :—Anzi Ven. 38. Anzi It. S. 188. 189. Mudd 112.

GEOG. DISTRIB :—Europe.

BOT. PROV :—5...10...15...(19—30.)

ENGLAND :—Oswestry ! *Rev. T. Salwey*. Cliffrigg ! Cleveland. *Mr. Mudd*. Aymestrey ! Herefordshire.

SCOTLAND :—Balthayock Woods ! Perth. *Dr. Lindsay*.

IRELAND :—Common. *Mr. Carroll*.

Forma *argentata*, Ach. whitish, thin, *sublaevigate* or slightly rugoso-unequal (*on rocks granuloso-or areolato-verrucose*) ; *apothecia plane or convex, fuscous or fusco-pallescent, margin entire, paraphyses free*.

On trees and rocks. 1793.

SYN :—Ach. L. U. 393. (1810.) Syn. 157. *glabrata*, Ach. l. c. on rocks *campestris*, Schar. En. 75. Nyl. Scand. 160. Stiznb. l. c.

FIG :—Hepp Sporen t. 8. f. 63. E. Bot. 450.



EXS :—Maudon 3. 54. Anzi It. S. 185. Fellman 125. 126. M. & N. 740. Anzi Ven. 40. Schær. 609. Lindig 154. Anzi It. S. 191. 192. Anzi Ven. 36. Hepp 63.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1...3...5...10...15...19...30.

ENGLAND :—Yorkshire, common. *Mr. Mudd.* Ludlow, Shropshire. *Dr. Babington.* Chudleigh Woods ; Dartmouth ; Stoke Wood, Devon. *Mr. Parfitt.* Kelvedon and Totham, Essex. *Mr. Varenne.*

SCOTLAND :—On rocks. *Mr. Dickson.* (1793.)

IRELAND :—Ardglass co. Devon. *Dr. Maingay.* near Cork Harbour. *Mr. Carroll.*

Forma *intumescens*, (Rebent.) whitish, *sublimitate*, *very thin, smooth*, at length *rimoso-areolate* ; apothecia convex, fuscous or nigro-fuscous, sometimes *livido-pruinose*, margin thick, *snow-white*, inflexed, sometimes *crenulate* ; paraphyses crowded, thick.

On trees.

SYN :—Rebent. Fl. Neomarch 301. (1804.) Stiznb. l. c.

FIG :—Hepp Sporen t. 70. f. 614.

EXS :—Anzi Langob. 102. Arn. 273. Hepp 614.

GEOG. DISTRIB :—Europe.

BOT. PROV :—5.

ENGLAND :—Stannor Hill ! Herefordshire. (1864.)

Forma *coilocarpa*, Ach. whitish, *sublimitate* or *limitate*, *thin, unequal or granulato-rugose*, (on rocks thicker *verrucoso-diffract*) ; apothecia small when young, concave, *fuscous-black or nearly black*, margin *entire or subentire* ; paraphyses free, slender.

On trees and rocks.

SYN :—Ach. L. U. 393. (1810.) Syn. 157. Nyl. Scand. 161. Stiznb. l. c. *pinastri*, Schær. En. 74.

EXS :—Schær. 310. Hepp 184. Anzi It. S. 186. Wright 117. Anzi Langob. 105. Lindig 160. Leight. 52. Larbal. 77.

GEOG. DISTRIB :—Europe.

BOT. PROV :—3...5...7...10...15...23...31.

ENGLAND :—Yorkshire, common. *Mr. Mudd.* Topsham, Exeter. *Mr. Parfitt.* Nesseliffe Hill ! Loppington ! Haughmond Hill ! Sharpstones Hill ! Shropshire.

SCOTLAND :—Blackberry Hill ! Perth. *Dr. Lindsay.*

IRELAND :—Lambay Island. *Mr. Carroll.*

WALES :—Aberdovey ! *Rev. A. Bloem.* Aber ! Cader Idris ! between Corwen and Bala !

CHANNEL ISLAND :—Boulay Bay, Rozel, La Coupe, Jersey ; Eperquerie, Sark ; Herm and Jethou ! *Mr. Larbalestier.*

Forma *gangalea*, Ach. albo-cinerascent, determinate, *radiate, thick, glabrous, rimose or rimoso-areolate* ; apo-

thecia frequent, sessile, at first concave then convex, black, margin entire or sub-crenulate; paraphyses subconglutinate.

On rocks.

SYN:—Ach. Syn. 152. (1817.) Nyl. Scand. 161. Stiznb. l. c.

EXS:—Maudon 55.

GEOG. DISTRIB:—Europe.

BOT. PROV:—5.. 7...10.. 31.

ENGLAND:—Oswestry! Shropshire. *Rev. T. Salwey*. Airyholme, Wood! Cleveland. *Mr. Mudd*. Abdon! Shropshire; Aymestrey! Herefordshire.;

WALES:—Festiniog Road near Dolgelley! Pen-Maen-Mawr!

CHANNEL ISLANDS:—Bordeaux Harbour, Guernsey. *Mrs. Collings*.

Forma *atrynea*, Ach. granulate or verrucoso-areolate, sometimes nigricanti-limitate; apothecia moderate, plane, rarely convex, fuscous or fusco-pallescent or corneo-fuscescent, margin subcrenate, rarely entire; paraphyses thick, subconglutinate,

On rocks and posts.

SYN:—Ach. L. U. 395. (1810.) Syn. 158. Nyl. Scand. 161. Stiznb. l. c.

EXS:—Fellm. 126. Rabh. 831.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1...3.. 19...31.

ENGLAND:—Devon. *Mr. Parfitt*. Messing, Essex. *Mr. Varenne*.

IRELAND:—Dinis, Killarney. *Mr. Carroll*.

CHANNEL ISLANDS:—Beauport, Jersey! *Mr. Larbalestier*.

Forma *epibrya*, Ach. whitish, granuloso- or verruculoso-cinerascent; apothecia fuscous or fusco-rufescent, plane, margin entire, often flexuose; paraphyses subconglutinate.

On mosses &c.

SYN:—Ach. Prod. 79. (1798.) Syn. 155. Nyl. Scand. 161. Stiznb. l. c.

FIG:—Hepp Sporen t. f. 185.

EXS:—Hepp 185. Schær. 311. Fellm. 124. Anzi It. S. 193. Arn. 107. Th. M. Fries. 8.

GEOG. DISTRIB:—Europe.

BOT. PROV:—10...30...31.

ENGLAND:—Guisbro' Moor, Cleveland. *Mr. Mudd*.

IRELAND:—Belfast. *Prof. Dickie*.

CHANNEL ISLANDS:—Quevairs, Jersey. *Mr. Larbalestier*.

Forma *chlarona*, Ach. whitish or cinerascent, determinate, thin, sublevigate or subrugose; apothecia plane,

or somewhat convex, *margin sub-entire or crenulate*; paraphyses slender, sub-conglutinate.

On trees and rocks.

SYN:—*distans*, Ach. Meth. 168. (1803.) *chlarona*, L. C. 397. Syn. 158. Stiznb. l. c.

EXS:—Anzi It. S. 187. 190 Hepp 778. Rabh. 803. 727. Anzi Ven. 37. Lught. 116. Mudd. 113. Maudon 2. Mass. 42.

GEOG. DISTRIB:—Europe.

BOT. PROV:—2, 3 ..5...10...23.

ENGLAND:—Near Stokesley! Cliffrigg! Cleveland. *Mr. Mudd*. Tilgate! *Mr. Lorbalestier*. Stoke Wood, Exeter. *Mr. Parfitt*. Kelvedon, Essex. *Mr. Varcane*. Ley Grange near Shrewsbury! Haughmond Hill! Shelton rough! Shropshire.

IRELAND:—Barclay's Rock. *Adm. Jones*.

Forma *albella*, (Pers.) *white*, silvery, determinate, thin, membranaceous, *smooth*; *apothecia* scattered, concave or plane, *pale or flesh-coloured*, *cæcio-pruinose* or naked, *margin entire*; paraphyses thick, free; thallus **K** yellow.

On trees, not common.

SYN:—Persoon in Ust. Ann. Bot. st. 11. p. 13. (1794.) Ach. Syn. 168. Nyl. Scand. 162. Stiznb. l. c.

FIG:—E. Bot. 2154. Hepp Sporen t. 21. f. 187.

EXS:—Hepp 187. M. & N. 1054. Schaer. 315. Fellm. 127. Anzi It. S. 178. Bohl. 77.

GEOG. DISTRIB:—Sweden, Germany, France, Helvetia, America, California, Isle Bourbon, Vosges, Hungary, Arctic America.

BOT. PROV:—1, 2, 3.. 5...10...15...31.

ENGLAND:—Stanstead Park, Essex. *Mr. Jacob*. Ayton, Cleveland. *Mr. Mudd*. Hay Park, Herefordshire. *Rev. T. Salwey*. Sussex! *Mr. Borrer*. Ide near Exeter; Exmouth! Chudleigh, Devon. *Mr. Parfitt*. Kelvedon, Essex. *Mr. Varcane*. Midland Counties. *Mr. Purton*. Pophills, Warwickshire. *Rev. W. S. Rufford*. Loppington! Haughmond Hill! Shropshire.

IRELAND:—Aviemore. *Adm. Jones*.

CHANNEL ISLANDS:—St. Ouen's Bay, Jersey. *Mr. Lorbalestier*.

Forma *angulosa*, (Ach.) *cinerascens*, membranaceous, smooth, at length *unequal* or rugoso-sub-rimose; *apothecia* crowded in the centre, *subangulose*, plane or slightly convex, *pale rufous or pale*, *slightly cæcio-pruinose*, *margin sub-entire or sub-crenulate*; paraphyses slender, sub-distinct.

On trees.

SYN:—Ach. Prodr. 54. (1793.) Syn. 166. Nyl. Scand. 161. Stiznb. l. c.

FIG :—Hepp Sporen t. 89. f. 780.

EXS :—Schær. 540. Hepp 780. Coëmans 322.

GEOG. DISTRIB :—Europe.

BOT. PROV :—3. 10. 24.

ENGLAND :—Yorkshire. *Mr. Mudd.* Totham, Essex. *Mr. Far-  
rall.*

IRELAND :—Castleconnel, Limerick. *Mr. Carroll.*

30. *L. leucophyma*, Leight. *greyish-pink, verrucoso-squamulose, squamules scattered* and distinct, plano-convex, or *hemispherico-tuberculose*, minutely innato-granulate, (K y C—); *apothecia sessile*, nigro-fuscous, convex, thalline margin entire, tumid; spores 8, colourless, elliptico-oblong, simple; paraphyses filiform, branched above and jointed; hymenea gelatina cærulescent with iodine.

On micaceo-schistose alpine rocks, very rare. 1864.

GEOG. DISTRIB :—Europe.

BOT. PROV :—15.

SCOTLAND :—Over Loch-na-Cat, Ben Lawers! *Messrs. Jones & Carroll.* (1864.).

Of this fine lichen only one fertile specimen has been found. The curious isidioideo-tuberculose thallus has often a pinkish tinge.

\*\*\*\* *Thallus K—C—.*

31. *L. epanora*, Ach. *greenish-yellow, squamuloso-globulose, globules small*, contiguous and conglomerate or dispersed, sub-radiato-lobate, *smooth* or *citrino-sorediate*; apothecia luteo-fulvous, plane, thalline margin thick, flexuose or sub-crenate; spores 8, colourless, ellipsoid, simple; thallus K—C—.

On rocks, rare. 1836.

SYN :—Ach. Prodr. 39. (1798.) Syn. 161. Nyl. Scand. 167. *L. albo-flavida*, Tayl. Fl. Hib. 2. 260.

FIG :—Hepp Sporen t. 89. f. 775.

EXS :—Leight. 397. Hepp 775. Th. M. Fries 35. Anzi Langob. 43.

GEOG. DISTRIB :—Sweden, Norway, Scandinavia, Walamo, (Africa).

BOT. PROV :—7. 19.

IRELAND :—Dunkerron. *Dr. Taylor.* (1836).

WALES :—Barmouth! *Rev. T. Salway.*

32. *L. mediana*, Nyl. *vitreous yellow* or citrine, opake, *plicato-radiate at the circumference, lacinia narrow, convex, incurved* and sub-crenate at the angles, *ni-*

*nutely granuloso-scabrous on the upper surface, in the centre broadly albido-cinerascent, or with scattered citrine granules, and minutely granulose or leproso-granulose, (K—); apothecia dirty flavescent or flavo-fuscescent, plane, thalline margin citrine, entire or crenulate; spores 8, colourless, oblongo-ellipsoid, simple.*

On calcareous rocks, rare. 1871.

SYN:—Nyl. in Bull. Soc. Bot. Fr. 9. p. 262. (1862.) and 13. p. 367. (1866).

GEOG. DISTRIB:—France.

BOT. PROV:—5.

ENGLAND:—Llanymynech Hill! Shropshire. (1871).

33. *L. epixantha*, Ach. *greenish-yellow* or *greenish-grey*, effuse, thin, *granulose* (K—C—); apothecia *crowded*, pale tawny-orange, plane or sub-convex; thalline margin sub-crenulate; spores 8, colourless, oblong, *polar-bilocular*.

On rocks, pales, posts, and trees, not common. 1861.

SYN:—Ach. L. U. 208. (1810.) Nyl. Scand. 141. Lapp Or. 127. *vitellinella*, Mudd Man. 135.

EXS:—Arnold 298.

GEOG. DISTRIB:—Europe, Bavaria.

BOT. PROV:—5...19.

ENGLAND:—Near Worcester. *Dr. Holl.*

IRELAND:—Rocks and Walls near Cork. *Mr. Carroll.*

34. *L. galactina*, (Ach.) *whitish*, *rugulose*, *appressed*, *sub-pulverulent*, *lobato-crenate* in the circumference; apothecia *crowded towards the centre*, *livido-carneo-fuscescent*, *more or less albo-pruinose*, margin *elevated*, *persistent*, eventually *crenulate* and *flexuose*; spores 8, colourless, ellipsoid, simple; thallus K—C—.

On plastered walls, rocks, &c. frequent.

SYN:—Ach. Meth. 190. (1803.) Syn. 187. Nyl. Scand. 134. Nyl. in Bull. Soc. Bot. Fr. 13. p. 367.

FIG:—Hepp Sporen t. 20. f. 180.

EXS:—Nyl. 123. Hepp. 180. Mudd 116.

GEOG. DISTRIB:—Sweden, Germany, Helvetia, France.

BOT. PROV:—3...5...8...10...15. (19—30).

ENGLAND:—Near Ayton! Cleveland. *Mr. Mudd.* Kelvedon, Essex. *Mr. Varcane.* Charnwood Forest, Leicestershire. *Rev. A. Bloxam.* Walls of Tong Priory! Shropshire.

SCOTLAND:—Near Aberdeen. *Rev. J. M. Crombie.*

IRELAND:—Common. *Mr. Carroll.*

*forma dispersa*, (Pers.) *sulcrustaceous*; apothecia



*dispersed, livido-pallescent or subcarneous or nigrescent, pruinose, margin white crenulate; thallus K—C—.*

On lime-rocks, frequent.

SYN:—Persoon in Ust. Ann. Bot. st. 7. p. 27. (1794.) Ach. Syn. 187. Nyl. in Bull. Soc. Bot. France. 13. p. 378.

FIG:—Hepp Sporen t. 8. f. 61.

EXS:—Hepp 61. Zw. 261.

GEOG. DISTRIB:—Northern Europe, France, Germany, Switzerland.

BOT. PROV:—1...5...10...31.

ENGLAND:—Battersby Bank and Carlton Bank, Cleveland. *Mr. Mudd.* Chance's Pitch, Malvern. *Dr. Holl.* Starcross. Devon. *Mr. Parfitt.*

CHANNEL ISLANDS:—Rozel, Jersey. *Mr. Larbalestier.*

forma *livida*, (Ach.) whitish, *rimoso-areolate*, glabrous, *areolae crenulate at the margins; apothecia* minute, crowded, *immersed*, disk plane, *livido-carneous*, *thalline margin entire*.

On rocks, rare.

SYN:—Ach. L. U. 375. (1810.) Syn. 170. Crombie Enum. 50.

GEOG. DISTRIB:—Europe.

BOT. PROV:—16.

SCOTLAND:—Appin. *Rev. J. M. Crombie.*

35. *L. umbrina*, (Ehrh.) *thallus nearly obliterated, hypothallus olivaceo-fuscescent, diffuse; apothecia* fuscous or fusco-nigricant, small, *cæsio-suffused*, *thalline margin white sub-crenulate; spores* 8, colourless, ellipsoid, simple; *paraphyses articulate; thallus K—C—.*

On rocks, old wood, &c.

SYN:—Ehrlhart Crypt. No. 245. (1793.) Ach. L. U. 368. Nyl. in Bull. Soc. Bot. Fr. 13. p. 369.

EXS:—Rabh. 747. 799. Anzi Langob. 318. 392. Arn. 21. Anzi It. S. 182.

GEOG. DISTRIB:—Sweden, Germany, France, Italy, Lombardy, Hungary, Bavaria.

BOT. PROV:—5.. 7...15, 16...24...30.

ENGLAND:—Llanymynech Hill! Shropshire.

SCOTLAND:—Kincardine. *Rev. J. M. Crombie.* Cumbrae! Buteshire. *Mr. W. Galt.*

IRELAND:—Co. Down. *Adm. Jones.* Cliffs of Moher, co. Clare. *Mr. Carroll.*

WALES:—Between Llangollen and Corwen!

forma *crenulata*, (Dicks.) cinereous, very thin, *nearly evanescent; apothecia* minute, dispersed, plane, *fuscous-*

*grey, margin white, persistent, crenulate* ; spores 8, colourless, ellipsoid, simple ; thallus K—C—.

On limestone rocks &c not uncommon. 1793.

SYN :—Dicks. Crypt. 3. 14. (1793.) Ach. Syn. 168. Nyl. in Gall. Soc. Bot. Fr. 13. p. 369.

EXS :—E. Bot. 930. Dicks. l. c. t. 9. f. 1. Hepp Sporen t. 8. f. 65.

FIG :—Hepp 65, Nyl. 125.

GEOG. DISTRIB :—Sweden, Finland, Switzerland, France.

BOT. PROV :—5..10, 11...(19—30).

ENGLAND :—Yorkshire. *Mr. Dickson*. (1793.) Eglestone, Durham. *Rev. J. Harriman*. Castle Eden ; Fulwell ; Boldon ; and Cleadon ; Middleton Beck ; and Barnard Castle, Durham ; Carham and Wark, Northumberland. *Mr. Winch*. High Rock ! near Bridgnorth, Shropshire.

IRELAND :—Not uncommon. *Mr. Carroll*.

*forma prosechoides*, Nyl. *dirty yellowish-white, tartareous, thin, sub-determinate, rimoso-areolate, areolae flat or slightly tumid and smooth* ; *apothecia* scattered, sessile, plane, *bluish-black, thalline margin entire* ; thallus K—C—.

On maritime rocks, rare. 1856.

SYN :—Nyl. in Crombie En. 51. (1870).

GEOG. DISTRIB :—Europe.

BOT. PROV :—6, 7..15.

SCOTLAND :—Kincardine. *Rev. J. M. Crombie*.

WALES :—Sutherland ! Glamorganshire. *Mr. Holl*. Barmouth ! (1856).

36. *L. Hageni*, (Ach.) *albo-cinerascent, thin, indeterminate, nearly evanescent* ; *apothecia* small, crowded, plane, at length tumid, *paler or darker brown, more or less pruinose* ; *margin white, persistent, crenulate* ; spores 8, colourless, ellipsoid, simple ; thallus K—C—.

On trees and old wood.

SYN :—Ach. Prodr. 57. (1798.) Syn. 167. Crombie En. 51.

EXS :—Anzi It. 8. 181. Zw. 65. Hepp 64. M. & N. 1053.

GEOG. DISTRIB :—Italy, Westphalia, Germany, Helvetia, Italy, Hungary, Prussia

BOT. PROV :—3...10, 11...15...24.

ENGLAND :—Yorkshire. *Mr. Mudd*. Teesdale, Durham. *Mr. Winch*. Kelvedon, Essex. *Mr. Varenne*.

IRELAND :—Near Limerick. *Mr. Carroll*.

*Mr. Crombie* finds a state designated by Dr. Nylander in litt. *subdistans* on maritime granitic rocks at Nigg, Portsethen, Kincardineshire ; and also var. *conferta*, Dub. (Bot. Gall. 654) woods near Aberdeen. "thallus thin, greenish or evanescent, paraphyses scarcely discrete."

37. *L. calcarea*, (Linn.) white or cretaceous, rimoso-areolate, effigurate at the circumference; apothecia immersed, plane, cæcio pruinose; spores 4-6-8, colourless, ellipsoid, simple; thallus K—C—.

On calcareous rocks, frequent.

SYN:—Linn. Sp. Pl. ed. 1. No. 6. (1753.) Ach. Syn. 143. Nyl. Scand. 154.

FIG:—E. Bot. 1940. Hepp Sporen t. 71. f. 627.

EXS:—Mudd 133. Leight. 13. Anzi It. S. 200. Hepp 627. 628. Nyl. 126. (farinose) Schaer. 476. Mass. 267. Anzi Etr. 21.

GEOG. DISTRIB:—Italy, Switzerland, Hungary, France, Pyrenees.

BOT. PROV:—1, 2, 3, 4, 5...7...10, 11...19.

ENGLAND:—Yorkshire, Sussex, and Suffolk. *Sir J. E. Smith.* Bilsdale! Yorkshire. *Mr. Muhl.* Bolton, Whitburn and Castle Eden, Teesdale, and Weardale, Durham. *Mr. Winch.* Coggeshall, Essex. *Mr. Farane.* Chudleigh Rocks; Budleigh Salterton, Devon. *Dr. Dick.* Aymestrey! Herefordshire; Llanymynech Hill! Shropshire.

IRELAND:—Blarney! co. Cork. *Mr. Carroll.*

WALES:—Great Ormes Head! Eglswg Rocks! Llangollen.

forma *Hoffmanni*, Ach. glaucescent or white, areolate, areolæ contiguous or dispersed; apothecia impressed in the centre of the turgescient areolæ, pruinose, thallus K—C—.

On calcareous rocks, frequent.

SYN:—Ach. Meth. 145. (1803.) Syn. 143. Nyl. Scand. 154.

FIG:—Hoffm. Pl. L. t. 22. f. 1. 4. Mass. Ric. f. 75.

EXS:—Anzi It. S. 210. Mudd 134. Hepp 629. Schaer. 131.

GEOG. DISTRIB:—Sweden, Germany, France, Switzerland, Italy.

BOT. PROV:—1...5...7...10...15...19...23...28...30.

ENGLAND:—Roseberry! *Mr. Mudd.* Oswestry! *Rev. T. Salvey.* Malvern Hills! *Mr. Lees.* Kenilworth Castle. *Mr. Larches-tier.* Chudleigh, Devon. *Mr. Parfitt.* High Rock! near Bridgnorth; Llanymynech Hill! Shropshire; Aymestrey! Herefordshire.

SCOTLAND:—Craig Guie; Craig Tulloch. *Rev. J. M. Crombie.*

IRELAND:—Near Belfast. *Mr. Templeton.* Portmahonck and Feltrim Hill, and near Dublin. *Dr. Taylor.* Antrim and Brandon Mountain. *Dr. Moore.* Armagh. *Adm. Jones.* near Cork. *Mr. Carroll.*

WALES:—Bryn-Maelgwyn! Great Ormes Head!

38. *L. gibbosa*, (Ach.) cinereous, angulari areolato verrucose, areolæ prominent, fertile ones elevated in the centre; apothecia areolate, thalline margin slightly cre

*nulate* ; spores 6-8, colourless, ellipsoid, simple, larger ; *thallus* K—C—.

On rocks, frequent. 1807.

SYN :—Ach. Prod. 30. (1798.) Syn. 139. Nyl. Scand. 154.

FIG :—E. Bot. 1732. Hepp Sporen t. 71. f. 624.

EXS :—Arn. 115. Zw. 60. Hepp 624. Leight. 175. Mudd 135.

GEOG. DISTRIB :—Hungary, Germany, Switzerland, Italy, Sweden.

BOT. PROV :—2...5...7...11...15...31.

ENGLAND :—South Downs, Sussex. *Mr. Borrer.* (1807.) Oswestry ! *Rev. T. Salway.* near Eglestone and Weardale Moors, Durham ; Shaftoe Crags near Wallington and Roadley, Northumberland. *Mr. Winch.* Malvern Hills ! St. Leonards, Sussex. *Dr. Holl.* Haughmond Hill ! Caer Caradoc ! Abdon Burf ! Shropshire.

SCOTLAND :—Kincardine. *Rev. J. M. Crombie.*

WALES :—Between Llangollen and Corwen ! Craig Breidden !

CHANNEL ISLANDS :—Noirmont, Jersey. *Mr. Lurbalectier.*

*forma depressa*, Ach. *caesio-cinerascent*, areolate, *areolae* small, depressed, plane ; *apothecia* immersed, areolate-impressed, *sub-lecideine*.

On alpine rocks, rare. 1870.

SYN :—Ach. Syn. 144. (1817.) Nyl. Scand. 153. Crombie En. 55.

GEOG. DISTRIB :—Sweden, Lapland, Norway.

BOT. PROV :—15, 19.

SCOTLAND :—Ben Lawers. *Rev. J. M. Crombie.*

IRELAND :—Dunkerron. *Dr. Taylor.*

*forma lacustris*, (With.) *pale* or *testaceous*, or *ochraceous*, *thin*, sub-determinate, plane, *slightly rimoso-areolate* ; *apothecia* minute, *pallido-rufescent*, *urceolato-innate* ; *thallus* K—C—.

On moist rocks over which water has flowed, not common. 1796.

SYN :—With. Arr. 4. p. 21. (1796.) Nyl. Scand. 155. *L. Acharii*, Westr in Ach. Prodr. p. 33. Ach. Syn. 137.

FIG :—With. l. c. t. 31. fig. 4. Ach. Prod. f. in tit. Hepp Sporen t. 71. f. 626. and f. 630.

EXS :—Zw. 114. Hepp 626. 630. Anzi Langob. 69. Schaer. 128. Mudd 136. Leight. 292.

GEOG. DISTRIB :—Germany, Sweden, Switzerland, France.

BOT. PROV :—5...7...10...15...(19—30).

ENGLAND :—Cockshaw Bank ! Yorkshire. *Mr. Mudd.* Wenlock ! Shropshire.

SCOTLAND :—Loch na Cat ! Ben Lawers. *Dr. Holl.*

IRELAND :—Not rare. *Mr. Carroll.*

WALES :—Llyn Aled. *Mr. Griffith.* (1796).

*forma punctata*, (Dicks.) greyish-white, thin, rimu-

lose, nigro-limitate; apothecia minute, numerous, sessile, black, plane, caesio-pruinose, thalline margin white, entire.

On rocks and walls, rare. 1793.

SYN:—Dicks. Crypt. 3. 15. (1793.) Crombie En. 55. *L. cyrtaspis*, Ach. L. U. 597. Syn. 137.

FIG:—E. Bot. 450.

GEOG. DISTRIB:—Europe.

BOT. PROV:—2...5...15...29, 30.

ENGLAND:—Ludlow, Shropshire. *Dr. Joseph Babington*. Coast of Sussex. *Rev. J. M. Crombie*.

SCOTLAND:—On rocks. *Mr. Dickson*. (1793).

IRELAND:—Northern Counties. *Adm. Jones*.

39. *L. Dicksonii*, (Ach.) ochraceo-ferruginous, thin, smooth, opaque, rimose or areolato-rimose, nigro-determinate; apothecia small, innate, concave, with thick black proper margin, nigricant within; hypothecium fuscous-black; spores 8, colourless, ellipsoid, simple; thallus K—C—.

On rocks, frequent. 1781.

SYN:—Ach. Prodr. 76. (1798.) Nyl. Scand. 155. *L. Oederi* Sm. *L. melanophæa*, Fr.

FIG:—E. Bot. 1117. Mass. Ric. fig. 67.

EXS:—Fellm. 120. Anzi It. S. 213 Zw. 25. Schaer. 123. Arn. 142. Leight. 127.

GEOG. DISTRIB:—Sweden, E. Lapland, Germany, Norway, Tyrol Alps, Italy, Switzerland.

BOT. PROV:—5...7...10, 11.. 14, 15...19.

ENGLAND:—Middleton! Teesdale. *Mr. Robertson*. Ingleborough. *Dr. Carrington*. Lonsdale, Cleveland. *Mr. Mudd*. Wrekin! Brown Clee Hill! Long Mynd! Shropshire.

SCOTLAND:—Near Edinburgh. *Sir J. E. Smith*. (1781.) Alpine rocks! *Mr. Dickson*. Kincardine. *Rev. J. M. Crombie*. Morrone. *Rev. J. M. Crombie*.

IRELAND:—Crogham, Killarney. *Mr. Carroll*.

WALES:—Anglesea. *Rev. Hugh Davies*. Barmouth! Moel Sia-bod! Snowdon!

40. *L. cinereo-rufescens*, (Ach.) darkly cinereous, whiter towards the circumference, areolato-verrucose, rimose, hypothallus nigricant; apothecia immersed, at first concave, eventually discoid, dark rufous, thalline margin entire; spores 8, colourless, ellipsoid, simple; thallus K—C—.

On sub-alpine rocks and walls, rare.



SYN :—Ach. L. U. 677. (1810.) Syn. 141. Nyl. Scand. 154.

FIG :—Mass. Ric. fig. 62.

GEOG. DISTRIB :—Lapland.

BOT. PROV :—7...15.

SCOTLAND :—Grampians. *Rev. J. M. Crombie.*

WALES :—Barmouth. *Rev. T. Salwey.*

forma *diamarta*, Ach. *ochrey-red*, *rimoso-areolate*, subdeterminate ; *apothecia immersed*, plane or slightly concave, *black*, thalline margin *flexuose*, *elevated*.

On alpine rocks, rare. 1870.

SYN :—Ach. Meth. 151. (1803.) Syn. 137. Nyl. Scand. 153. Crombie En. 55.

EXS :—Anzi Langob. 74.

GEOG. DISTRIB :—Norway, Russia, E. Pyrenees, Lombardy.

BOT. PROV :—15.

SCOTLAND :—Breadalbane *Rev. J. M. Crombie.*

41. *L. epulotica*, (Ach.) *pale* or *pallido-ochraceous* or whitish, thin, *rimulose* or sub-continuous ; *apothecia urceolate* or *innate*, moderate, *carneous* or *carneo-rufescent*, margin thickish, *concolorous*, *circumcised* from the thallus ; spores 8, colourless, elliptico-oblong, simple ; thallus K—C—.

On calcareous rocks, not common.

SYN :—Ach. L. U. 151. (1810.) Syn. 9. *Lecidea*, Nyl. Scand. 189.

EXS :—Arn. 41. Zw. 281. Anzi Langob. 77.

GEOG. DISTRIB :—Switzerland, Hungary, Lombardy, Germany.

BOT. PROV :—1, 2...7...11.. 15.

ENGLAND :—Middleton-in-Teesdale. *Rev. J. Harriman.* Bolshope Bourn, Durham. *Mr. Winch.* Torquay and near Exeter. *Mr. Parfitt.* near Ashburton, S. Devon. *Dr. Holl.*

SCOTLAND :—Ben Lawers. *Dr. Holl.* Trossachs ; Killin ; Ben Lawers ; Craig Tulloch ; The Khoil. *Rev. J. M. Crombie.*

WALES :—Llyn Gwernan, Dolgelly. *Dr. Holl.* Nant Gwynant ! Snowdon

Var. *Prevostii*, Fr. *cerustaceous* ; *apothecia immersed* in the rock, deformed, margined.

On calcareous rocks, not common.

SYN :—Fries L. E. 197. (1831.) Nyl. Scand. 189.

FIG :—Leight. Ang. Lich. t. 15, f. 1.

EXS :—M. & N. 848. Mass. 330.

GEOG. DISTRIB :—Sweden, Germany, Italy, Switzerland, France.

BOT. PROV :—8..15.

ENGLAND :—Cheddar ! *Mr. Borrer.*

SCOTLAND :—Craig Guie, Braemar. *Rev. J. M. Crombie.*

42. *L. ladia*, Ach. *olivaceo-fuscous* or *badio-fusces-*

cent or fusco-cinerascent, shining, granulato-areolate; apothecia appressed, numerous, often crowded, badio-fuscons or fuscous-black, shining, thalline margin entire or crenulate; spores 8, colourless, fusiformi-ellipsoid, simple; thallus K—C—.

On mountain rocks, frequent.

SYN:—Ach. Syn. 154. (1817.) Nyl. Scand. 170.

FIG:—Hepp Sporen t. 20. f. 181.

EXS:—Nyl. 42. Hepp 181. Fellm. 136. Anzi It. S. 167.

GEOG. DISTRIB:—Europe, generally.

BOT. PROV:—1...5...8...10, 11...15...18...30, 31.

ENGLAND:—Ingleborough. *Dr. Currington*. Battersby Moor, Ayton Moor!; Kildale Moor! *Mr. Mudd*. Charnwood Forest! Bardon Hill! Leicestershire. *Rev. A. Bloam*. near Eglestone, Durham. *Rev. J. Harriman*. Torquay, Devon. *Mr. Parfitt*. Stan-nor Hill! Herefordshire; Devil's Mouth! Long Mynd; Caer Caradoc!; Bodbury Ring!; near Church Stretton; Abdon Burf! Shropshire.

SCOTLAND:—Garrynahine, Lewis. *Dr. Lindsay*. Ben Lawers; Coast of Kincardine; Cavin Tuik, Braemar. *Rev. J. M. Crombie*.

IRELAND:—Near Belfast. *Mr. Templeton*, Lurgedon Mountain, co. Antrim. *Dr. Moore*. Mount Leinster, Carlow, and near Carn-lough co. Antrim. *Adm. Jones*.

WALES:—Snowdon, Llanberis ascent! Barmouth! Cader Idris!

CHANNEL ISLANDS:—Jersey; Guernsey. *Mr. Larbalestier*.

forma cinerascens, Nyl. paler, cinerascens.

On mountain rocks, frequent.

SYN:—Nyl. Scand. 170. (1861).

EXS:—Anzi It. Etr. 18.

GEOG. DISTRIB:—Norway.

BOT. PROV:—7. 15.

SCOTLAND:—Kincardine. *Rev. J. M. Crombie*.

WALES:—Cader Idris!

Var. *atriseda*, Fr. *b. unneo-fuscous*, granulato-areolate, granules more or less dispersed, tumid and convex; hypothallus thin, black; apothecia pallio-fuscescent, innato-sessile in the granules, thalline margin thickish; spores ellipsoid, simple; thallus K—C—.

On mountain rocks, not common. 1869.

SYN:—Fr. L. E. 149. (1831.) Nyl. Scand. 170.

GEOG. DISTRIB:—Sweden, Finland.

BOT. PROV:—7.

WALES:—Dolgelly! *Dr. Holl*.

forma *picea*, Dicks. *pitch-black*; *apothecia black*.

On alpine rocks, rare. 1801.

SYN:—Dicks. Crypt. 4. 12. (1801).

FIG:—Dicks. l. c. t. 12. f. 5.

EXS:—Mudd 110.

GEOG. DISTRIB:—Europe.

BOT. PROV:—5. 10...15.

ENGLAND:—Top of Roseberry! Cleveland. *Mr. Mudd* Abdon Burf! Shropshire.

SCOTLAND:—Granipians; Morrone! *Rev. J. M. Crombie*. Ben Lawers. *Dr. Holl*.

43. *L. rhypariza*, Nyl. pale or lurido-cinerascent, granulose or granuloso-squamulose, squamulae sublobulato-concrescent or sub-dispersed; apothecia fuscous, plane; spores 8, colourless, oblong or cylindraceo-oblong, simple.

Forma *curvescens*, Mudd. *fuscous-black*, minutely granuloso-squamulose; apothecia *elevato-sessile*, margin paler, smooth, inflexed; spores 6-8, obtusely fusiform, curved, simple; thallus K—C—.

On alpine mosses and rocks, rare; 1864.

SYN:—Nyl. in Ofvers V. Ak. Forh. 1860. p. 296. Scand. 169. Mudd Man. 125. Crombie En. 53.

FIG:—Mudd Man. t. 2. f. 38.

GEOG. DISTRIB:—Norway.

BOT. PROV:—15.

SCOTLAND:—Summit of Ben Lawers! *Mr. Carroll*, (1864).

44. *L. poliophæa*, (Whlbn.) cinerascent or cinereo-fuscescent, *granulato-papillate*, *diffract*, or papillato-verrucose, *fibrillose-byssine* and *albido-radiate* at the circumference; apothecia dark reddish-brown, plane, *thalline margin crenulate*; spores 8, colourless, ellipsoid, simple, K reddish-brown.

On maritime rocks, rare. 1821.

SYN:—Wahlenberg Fl. Lapp. 410. (1812.) Ach. Syn. 169. Nyl. Scand. 158.

FIG:—E. Bot. Suppl. 2662. f. 3. Wahl. l. c. t. 27. f. 3.

GEOG. DISTRIB:—Norway, Finmark, Ireland.

BOT. PROV:—1.. 11. 15...30.

ENGLAND:—Bamburgh and Staples Islands, Northumberland. *Mr. Robertson*. (1821.) Tol Peden Penwith, Cornwall! *Mr. Borrer*.

SCOTLAND:—Kincardine. *Rev. J. M. Crombie*.

IRELAND:—Barelay's rock co. Down. *Adm. Jones*.

45. *L. verrucosa*, Ach. *white*, glaucescent, *verrucose*,

smooth or slightly pulverulent; *apothecia at first immersed in the thallodal verruca*, (externally like a *Per-tusaria*,) *ultimately urceolate*, rather large, *black*, slightly pruinose, *thalline margin thick, entire, inflexed*; spores 8, colourless, ellipsoid, simple, large; thallus K—C—.

On mosses in alpine localities, rare. 1861.

SYN:—Ach. L. U. 339. (1810.) Nyl. Scand. 156. Mudd Man. 164.

FIG:—Hepp Sporen t. 71. f. 193.

EXS:—Hepp 193. Tuck. 22. Anzi It. S. 211. Th. M. Fr. 36. Schaer. 133.

GEOG. DISTRIB:—E. Finmark, Bavaria, Switzerland, Italy, Hungary, Sweden, Norway, Mackenzie River and White Mountains, N. America.

BOT. PROV:—15.

SCOTLAND:—Craig Calliach and Ben Lawers. *Dr. Maingay*. (1861.) Ben Lawers! *Sir W. J. Hooker*. Craig Tulloch; above Loch-na-Cat. *Rev. J. M. Crombie*.

\*\*\*\*\* *Disk of apothecium C yellow.*

46. *L. glaucoma*, (Hffm.) whitish or glaucous-white *rimoso-areolate*; *apothecia livid or livido-nigricant, innate or sub-sessile*, plane or convex, *caesio-pruinose*, thalline margin thin or tumid, entire, flexuose, or obliterated; spores 8, colourless, ellipsoid, simple; *disk of apothecium C yellow, thallus K yellow.*

On rocks, frequent.

SYN:—Hoffm. Fl. G. 172. (1795.) Ach. Syn. 165. Nyl. Scand. 159.

FIG:—E. Bot. 2156.

EXS:—Schaer. 304. Mudd 122. Dicks. 22. Zw. 72. Korb. 217. Anzi It. S. 196. A. C. M. & N. 547. Leight. 53.

GEOG. DISTRIB:—Pyrenees! Switzerland! Italy! S. W. Germany! Silesia! Vosges! Tyrol Alps!

BOT. PROV:—1...5, 6, 7 ..10, 11 ..15 ..(19—30)...31.

ENGLAND:—Cliffrigg; Cleveland. *Mr. Mudd*. Bolt Head! S. Devon. *Dr. Holl*. Northumberland and Durham. *Mr. Winch*. Dunsford; Goodrington; Chudleigh, Devon. *Mr. Parfitt*. Haughmond Hill! Bodbury Ring! near Church Stretton.

SCOTLAND:—Portlethen, Kincardineshire. *Rev. J. M. Crombie*.

IRELAND:—Not rare. *Mr. Carroll*.

WALES:—Anglesea! *Rev. Hugh Davies*. Aberdovey! *Rev. A. Blewett*. Moel-y-Goffa! Montgomeryshire; Borth! Cardiganshire.

CHANNEL ISLANDS:—Common on all the Islands. *Mr. Lurbaes-ier*.

*Forma carulata*, (Flot.) *apothecia caruleo-nigricant*,

*casio-pruinose*, plano-convex, thalline margin obliterated, proper margin thin, black, flexuose.

On rocks.

SYN :—Flot. L. Siles. p. 123. (1850.) Ach. Syn. 166. *lecidina*, Nyl. Prod. 88.

FIG :—Hoffm. Pl. Lich. t. 53. f. 5.

EXS :—Zw. 73. 74. Arn. 212 Anzi Langob. 67.

GEOG. DISTRIB :—Tyrol Alps! Switzerland! Madeira! Norway! Lombardy! Arctic America!

BOT. PROV :—15.

SCOTLAND :—Highlands! Mr. Borrer.

Forma *cinereo-pruinosa*, apothecia *hemispherical*, disk *convex*, *carneous*, granulate, *cinereo-pruinose*, margins *obliterated*.

On rocks.

FIG :—Hepp Sporen t. 8. f. 60. and t. 103. f. 904.

EXS :—Hepp 60. 904.

GEOG. DISTRIB :—Sweden! Italy! Germany!

BOT. PROV :—10...23.

ENGLAND :—Lanbraughrigg! Cleveland. Mr. Mudd.

IRELAND :—near Kinsale. Mr. Carroll.

Forma *Swartzii*, (Ach.) diffuse, *verrucoso-granulato-areolate*, “*ambitu radioso-fimbriato*”; apothecia *aggregato-conglomerate*, deformed, *cinereo-glaucous*, *pruinose*, margin *thick*, *subtumid*, *undulate*.

On alpine rocks, rare. 1801.

SYN :—Ach. Prod. 55. (1798.) Syn. 166. Nyl. Scand. 159. Dicks. Br. Crypt. 4. 23

FIG :—Ach. N. Act. Sc. Stochh. 15. t. 6. f. 3.

EXS :—Arn. 249.

GEOG. DISTRIB :—Hungary! Bavaria!

BOT. PROV :—15.

SCOTLAND :—Highlands! Mr. Dickson, near Invercauld co. Aberdeen. Mr. Brown. (1810) Morrone in Braemar. Rev. J. M. Crombie.

\*\*\*\*\* *Disk of apothecium C—.*

47. *L. sub-carnea*, (Ach.) yellowish-white, tartareous, *granulato-areolato-rimose*, *sub radiate* at the circumference; apothecia *carneous*, plane or convex, *smooth*, *pruinose*, frequently *coaglomerato-deformed*, margin *thick*, *subtumid*, *undulate*, in age thinner and *subobliterate*; spores 8, colourless, ellipsoid, simple; *disk of apothecium C—*, thallus K yellow then orange red.

On alpine rocks, rare.

SYN :—Ach. Meth. 59. (1803) Syn. 45. Nyl. Scand. 159.



FIG :—Ach. N. Act. Stockh. 15. t. 6. f. 4. Hepp Sporen t. 103. f. 905.

EXS :—Nyl. 41. Zw. 75. Hepp 905. Lindig 164. Anzi Etr. 19. Mass. 309.

GEOG. DISTRIB :—Fontainebleau ! Ardennes ! Lozère ! France ! Germany ! Heidelberg ! Algeria ! Lapland ! Bogota ! N. Granada, Italy !

BOT. PROV :—15.

SCOTLAND :—Morrone ! Braemar. *Rev. J. M. Crombie.*

*C. Spores polari-bilocular.*

48. *L. aurantiaca*, (Lightf.) *flavescent* or *pale lemon-colour*, *granulate*, *rugose* or *unequal*, *rimose* ; *apothecia orange-coloured*, *biatorine*, *thalline margin obtuse*, *pale-yellow*, *undulate* ; *spores 8*, *colourless*, *ellipsoid*, *polari-bilocular* ; *thallus and apothecia K crimson.*

*var. salicina*, (Schrad.)

*On trees. 1782.*

SYN :—Lightfoot Fl. Scot. 2. 810. (1777.) Ach. Syn. 50. 175. Nyl. Scand. 142. Schrad. Spicil. 82.

FIG :—E. Bot. 1305. Hffm. Pl. L. t. 61. f. 3—9.

EXS :—M. & N. 1151. Schaer. 537. Fellm. 107. Welw. Lusit. 67. Mudd 99. Anzi Venet. 27. Bohl. 118. Fries 41. Leight. 212.

GEOG. DISTRIB :—Europe, Africa, America, Australasia.

BOT. PROV :—1, 2, 3, 4...8.. 11...14...(19—30)...31.

ENGLAND :—Kennington. *Mr. Sowerby.* Sussex. *Mr. Borrer.* Haddiscoe, Suffolk. *Mr. Turner.* Cocken ; Castle Eden and Dalton Denes ; Gibside ; Hamsterley ; Teesdale, Durham ; near Hexham and Chollerford, Northumberland. *Mr. Winch.* near Berwick. *Dr. G. Johnston.* Exminster Marshes, Devon. *Mr. Partitt.* Gopsall Park, Leicestershire. *Rev. A. Blaxam.* Goldhanger, Essex. *Mr. Varenne.*

SCOTLAND :—Edinburgh. *Sir J. E. Smith.* (1782).

IRELAND :—Frequent. *Mr. Carroll.*

CHANNEL ISLANDS :—Jersey ; Guernsey. *Mr. Larchestier.*

*Var. erythrella*, Ach. *yellowish*, *thin*, *areolato-diffract*, or *rugose and rimose* ; *apothecia dark orange*, *margin thin*, *obliterated* ; *thallus and apothecia K crimson.*

*On rocks and earth, frequent.*

SYN :—Ach. Meth. 174. (1803.) Syn. 175. Nyl. Scand. 142.

FIG :—Hffm. Pl. L. t. 20. f. 1. E. Bot. 1993.

EXS :—Hepp 198. Anzi It. S. 136. Mudd 100. Schaer. 223. Mass. 238. 239. Zw. 94.

GEOG. DISTRIB :—Europe, America.

BOT. PROV :—1...5...10.. 15...18, 19.

ENGLAND :—Bath ! *Mr. Broome.* Craig-y-Nhiw near Oswestry ! *Rev. T. Salway.* Kildale ! Roseberry ! Cleveland. *Mr. Mudd.*

Devonshire. *Mr. Parfitt*. Llanymynech Hill ! Red Hill ! Shropshire.

SCOTLAND :—Glen Orchy about Loch Tay and elsewhere in the Highlands. *Messrs. Hooker & Borrer*. Garrynaline, Lewis ; Stennis, Orkney. *Dr. Lindsay*.

IRELAND :—Blackrock ! near Cork. *Mr. Carroll*.

Var. *inalpina*, Ach. *pale-yellowish or greenish*, very thin, *minutely areolato-rimose*, unequal, *furfuraceous* ; apothecia *orange*, margin *paler, flavescens* ; K crimson.

On rocks, not unfrequent.

SYN :—Ach. L. U. 388. (1810.) Syn. 179. Nyl. Scand. 142. Mudd Man. 137.

EXS :—Mudd 101.

GEOG. DISTRIB :—Europe.

BOT. PROV :—3...5 ..8...10...15, 16...19.

ENGLAND :—Lanbraugh Rigg ! Darlington ; Yarm ; Easby ! Cleveland. *Mr. Mudd*. Kelvedon ; Messing, Essex. *Mr. Varenne*. Breton Hill ! Leicestershire ; Middle ! Llanymynech Hill ! Shropshire.

SCOTLAND :—Western parts. *Rev. J. M. Crombie*.

IRELAND :—Whitepoint ! Cork. *Mr. Carroll*.

Var. *rubescens*, (Schær.) yellow or greyish-brown, *leproso-tartareous*, thin, *rimoso-diffract*, often evanescent ; apothecia small, *dark orange-red*, margin *concolorous* ; K crimson.

On rocks, rare.

SYN :—Schær. Spic. 185. Ach. Syn. 176. Nyl. Scand. 142. Mudd Man. 138.

FIG :—Hepp Sporen t. 72. f. 636.

EXS :—Hepp 636. 637. Mass. 249. Anzi It. S. 135. Schær. 224.

GEOG. DISTRIB :—Europe.

BOT. PROV :—7...10...19.

ENGLAND :—Kildale ! Cleveland. *Mr. Mudd*.

IRELAND :—Dunkerron. *Dr. Taylor*,

WALES :—Near Llangollen !

49. *L. ochracea*, (Schær.) pale ochrey-yellow, thin, continuous or obsoletely *rimoso-areolate* ; apothecia *croceo-sulvovs* or orange, plane, margin entire, paler ; spores 8, colourless, *polaris-bilocular* ; thallus and apothecia K crimson.

On limestone rocks, not common.

SYN :—*Lecidea*, Schær. in Nat. Anz. 1810. p. 11. *L. aurantiaca* var. Nyl. Prodr. 76. *L. icterica*, Tayl !

EXS :—Schær. 222. Zw. 268. Arn. 224. Anzi It. S. 138. Mass. 114.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1...3...8...10...19 ..24...28.

ENGLAND :—Torquay ! Devon. *Dr. Deakin*. Malham Tarn, York-

shire. *Mr. Tailstone*. Buxton, Derbyshire; *Rev. J. M. Crombie*. Hope near Kingsbridge, S. Devon. *Dr. Holl*. Heavitree, Exeter. *Mr. Farfitt*.

IRELAND :—Dunkerron! *Dr. Taylor*. Carrigoginnel, Limerick; Kenmare. *Mr. Carroll*. Sheep Walk, Armagh. *Adm. Jones*.

50. *L. ferruginea*, (Huds.) *albo-cinerascent* or *plumbeo-cinerascent* or *cæsious*, thin, *smoothish*, contiguous or *furfuraceous*, or *crustaceous*, *granuloso-or verruculoso-areolate*, or *evanescent*; apothecia *ferruginous-red*, *biatorine*, plane, proper margin *flexuose* or *undulate*, paler; spores 8, colourless, ellipsoid, *polar-bilocular*.

On trees and rocks, not uncommon. 1778.

forma *corticola*, *albo-cinerascent*, *smoothish*, contiguous or *furfuraceous*.

SYN :—Huds. Fl. Angl. ed. 2. p. 526. (1778.) Nyl. Scand. 143.

FIG :—E. Bot. 1650. (in part) Hfm. Pl. L. t. 12. f. 1.

EXS :—Zw. 95. A. Schær. 583. Mass. 221. Anzi It. S. 145. Bohl. 108. M. & N. 1055.

GEOG. DISTRIB :—Europe, Asia, Africa, America.

BOT. PROV :—1, 2, 3...5...10...13...13...31.

ENGLAND :—Sussex! *Mr. Borrer*. Halfpenny Hill! Yorkshire. *Mr. Baker*. Airyholme Wood! Cleveland. *Mr. Mudd*. Salcombe Hill, Sidmouth; Berry Head, Torbay; Lustleigh Cleve; Whitstone Hill. Devon. *Mr. Parfitt*. Plymouth. *Mr. Holmes*. Kelvedon; Feering; Rivenhall, Essex. *Mr. Varnne*. Malvern Hills. *Mr. Purton*. Salford Bridge, Warwickshire. *Rev. W. S. Rufford*. Haughmond Hill! Shropshire.

SCOTLAND :—Ayrshire. *Mrs. Dobie*.

IRELAND :—Glenarm Park!; Blarney! *Mr. Carroll*.

CHANNEL ISLANDS :—Jersey; Guernsey; Sark. *Mr. Lorbalestier*.

forma *saricola*, *plumbeo-cinerascent* or *cæsious*, thickish, *crustaceous*, *granuloso-or verrucoso-areolate*.

SYN :—Nyl. Scand. 143.

FIG :—E. Bot. 1650. (in part).

EXS :—Zw. 95. B. Mass. 225. 224. 223. Schær. 448. Mudd 102. Anzi It. S. 144. Langob. 28. Maudon 60. Fellm. 109. Leight. 85.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2.. 5.. 7...10...13.. 18...(19—30).

ENGLAND :—Cliffrigg! Roseberry! Cleveland. *Mr. Mudd*. Sussex! *Mr. Borrer*. Oswestry! *Rev. T. Salway*. Bodbury Ring! near Church Stretton; Haughmond Hill! Shropshire. Stannor Hill! Herefordshire.

SCOTLAND :—Glasgow! *Mr. Gall*. Stennis, Orkney. *Dr. Lindsay*.

IRELAND :—Common on rocks! *Mr. Carroll*.

WALES :—Aberdovey! *Rev. A. Bloom*. between Bala and Dolgelly!

forma *festiva*, (Ach.) thallus *evanescent*, apothecia numerous.

On rocks.

SYN :—Ach. Syn. 44. (1817.) Nyl. Scand. 143.

FIG :—Hepp Sporen t. 22. f. 201.

EXS :—Körb. 276. Hepp 201. Schær. 449. Anzi Langob. 272.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1...5 ..15...19...30, 31.

ENGLAND :—Oswestry ! *Rev. T. Salwey*. Starcross, Devon. *Mr. Parfitt*.

IRELAND :—Larne co. Antrim *Dr. Moore*.

CHANNEL ISLANDS :—Jersey ; Guernsey ; Sark, *Mr. Larbalestier*.

Mr. Crombie finds on maritime rocks in Kincardineshire a var. *concilians*, Nyl. Scan. 143 "thallo cinerascente, granuloso-areolato, apotheciis ferrugineo-fuscis vel fusco-nigris, lecanorinis vel demum biatorinis." And also at Cove, Kincardineshire, another var. *fusco-atra*, (Zw. 96.) in which the apothecia have a distinct thalline margin. Mr. Carroll has also observed another state or variety *polypæna*, Ach. (Nyl. Scand. 143) "apotheciis fusciscentibus" at the upper Lake, Killarney,

51. *L. cerina*, (Ehrh.) *cinereous*, thin, unequal or granulate, hypothallus nigricanti-cærulescent ; apothecia pale waxy-yellow, lecanorine, plane, thalline margin distinct, entire, thin ; spores 8, colourless, ellipsoid, polari-bilocular, with longitudinal channel ; K crimson.

On trees &c. frequent. 1793.

SYN :—Ehrhart Crypt. No. 216. (1785.) Ach. Syn. 173. Nyl. Scand. 144.

FIG :—E. Bot. 627. Hfm. Pl. L. t. 33. f. 1. b. Hepp Sporen t. 22. f. 203.

EXS :—M. & N. 460. Schær. 219. Hepp 203. Mudd 97. Leight. 83.

GEOG. DISTRIB :—Europe, Africa, N. America.

BOT. PROV :—1...3, 4, 5...10, 11 ..(19—30) 31.

ENGLAND :—Oswestry ! Shropshire. *Rev. T. Salwey*. Ayton, ! Bilsdale ! Cleveland. *Mr. Mudd*. Coltishall, Norfolk. *Mr. Turner*. Lambeth. *Mr. Sowerby*. Woods on the Derwent ; near Healeyfield and about Gainford, Durham. *Mr. Winch*. Countess Weir, Exeter. *Mr. Parfitt*. Plymouth. *Mr. Holmes*. Colchester ; Easthorpe ; Kelve-ton ; Osey Island, Essex. *Mr. Varenne*. Midland Counties. *Mr. Purton*. Sutton ! near Shrewsbury.

IRELAND :—Common. *Mr. Carroll*.

CHANNEL ISLANDS :—Common on all the larger Islands. *Mr. Larbalestier*.

Var. *cyanolepra*, (DC.) *cinereo-cærulescent*, hypothallus prædominating over the thin thallus.

On smooth-barked trees.

SYN :—De Candolle Fl. Franc. 2. 560. (1805.) Nyl. Scand. 144.

FIG :—Hffm. Pl. L. t. 33. f. 1. a.

EXS :—Fellm. 105. Mass. 226. Anzi Langob. 300.

GEOG. DISTRIB :—E. Lapland, France, Italy, Switzerland, Lombardy, Scandinavia.

BOT. PROV :—5.

ENGLAND :—New Forest. *Rev. J. M. Crombie*. Near Shrewsbury !

Var. *chlorina*, Fw. *verdigris-green*, *granulato-areolate*, compact, thallus and hypothallus intermingled.

On rocks, rare. 1861.

SYN :—Flotow Fl. Siles. 126. (1849.) Mudd Man. 136.

EXS :—Anzi Langob. 33. Körb. 128.

GEOG. DISTRIB :—Germany, Silesia.

BOT. PROV :—10.

ENGLAND :—On rocks near Newton, Cleveland. *Mr. Mudd*. (1861.)

Var. *stillicidiorum*, (Hornem.) *albo-cinerascent*, effuse, thin, *granulate* or *leprose* ; *apothecia* *paler* or *darker*, *waxy-yellow*, *margin pallido-cinerascent*.

On mosses, not common. 1799.

SYN :—Hornemann in Fl. Dan. t. 1063. f. 2. (1792.) Ach. Syn. 173. Nyl. Scand. 144.

FIG :—E. Bot. 1373.

EXS :—Bohl. 94. Anzi Langob. 92. Mass. 229.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1...3...7, 8...11.. 15.

ENGLAND :—Eglestone, Durham. *Rev. J. Harriman*. (1799.) Teesdale. *Rev. J. M. Crombie*. near Buxton, Derbyshire. *Dr. Holl*. Moreton Hampstead, Dartmoor, Devon. *Mr. Parfitt*. Goldhanger, Essex. *Mr. Varenne*.

SCOTLAND :—Castleton, Braemar. *Adm. Jones*. Morrone ; Craig Tulloch. *Rev. J. M. Crombie*. Ben Lawers. *Dr. Holl*.

WALES :—Dolgelley. *Dr. Holl*.

52. *L. pyracea*, (Ach.) *whitish* or *obsolete* and *evanescent* ; *apothecia* *red-orange*, *small*, *biatorine*, *pale*, *marginated*, at length *convex*, (K *crimson*) ; spores 8, colourless, ellipsoid, 1-septate or *polaris-bilocular* with longitudinal tube.

On trees and walls.

SYN :—Ach. Meth. 176. (1803.) Syn. 49. Nyl. Scand. 145.

FIG :—E. Bot. 2245.

EXS :—Fellm. 106. Nyl. 120. M. & N. 1150. (upper specimen) Mudd 93. 146. Hepp 500. Zw. 328. Bohl. 76. Arn. 281. Leight. 213.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1...5 ..7, 8...10, 11...13, 14.

ENGLAND :—Near Masham ! Ingleby ! Yorkshire. *Mr. Mudd*. Oswestry ! Shropshire. *Rev. T. Salway*. Twycross, ! Leicestershire.



*Rev. A. Blozum*, Beamish, Durham. *Mr. Winch*, Torquay! Devon.  
*Dr. Deakin*.

SCOTLAND :—Southern parts. *Rev. J. M. Crombie*.

WALES :—Llyn Aran, Cader Idris!

Var. *ulmicola*, (DC.) apothecia orange-yellow, margin paler yellow.

On trees, not common. 1805.

SYN :—De Candolle *Pl. Franc.* 3. 358. (1865.) Hook. Br. Fl. 2. 186. *L. luteo-alba*, Ach. Syn. 49. Nyl. Scand. 145.

FIG :—E. Bot. 1426.

EXS :—Mass. 234. 232. Schaer. 475. Anzi It. S. 139. 140. Hepp 202.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1, 2, 3...5...10...24.

ENGLAND :—Sussex! *Mr. Borrer*, Easby Wood! Cleveland. *Mr. Mudd*, near Stoke House, Chichester! *Mr. Cooke*, Whitstone, Exeter. *Mr. Parfitt*, Kelvedon; Coggeshall; Braxted; Witham, Essex. *Mr. Varcene*, Pophills, Warwickshire. *Rev. W. S. Rufford*.

IRELAND :—Castleconnel! near Limerick. *Mr. Carroll*, Curraghmore. *Adm. Jones*.

Var. *holocarpa*, (Ehrh.) greyish-black, thin, entire or scattered and furfuraceous, granulate; apothecia crowded, angular, waxy yellow-orange, sub-concave or plane, margin entire, paler.

On flints and palings, not frequent.

SYN :—Ehrhart Crypt. No. 284. (1793.) Ach. Syn. 49. Nyl. Scand. 145. Mudd Man. 137.

FIG :—E. Bot. 2009. Hepp Sporen t. 9. f. 73.

EXS :—Hepp 73. Mass. 233. 235. Anzi Langob. 96.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1, 2, 3...4, 5...10.

ENGLAND :—Sussex Downs! *Mr. Borrer*, Bury. *Rev. G. R. Leathes*, Ingleby! Cleveland. *Mr. Mudd*, Bath. *Mr. Broome*, Penzance. *Rev. T. Salwey*, Anstey's Cove, Torquay. *Mr. Parfitt*, Kelvedon; Messing, Essex. *Mr. Varcene*, Grafton, Warwickshire. *Rev. W. S. Rufford*.

Var. *pyrithroma*, (Ach.) brownish-grey, continuous, rugulose; apothecia minute, sub-immersed, concave, pale greenish-dun colour with a bright-yellow pruina, margin very tumid, inflexed, bright yellow.

On siliceous slate.

SYN :—Ach. L. U. 206. (1810.) Syn. 39. Crombie Enum. 47. *picta*, Tayl. Fl. Hib. 2. 130.

GEOG. DISTRIB :—France, Sweden.

BOT. PROV :—11...19.

ENGLAND :—Durham. *Rev. J. Harriman*.

IRELAND :—Dunkerron and elsewhere in co. Kerry. *Dr. Taylor.*

53. *L. arenaria*, (Pers.) *albo-cinereascent*, thin, *granulato-pulverulent* at the centre, *reticulato-lobate*, and crenate at the *circumference*; apothecia sessile, plane, *dark tawny-red*, *margin pale orange-red*, *thalline margin white*, crenate, undulate; spores 8, colourless, elliptico-oblong, polari-bilocular.

On rocks and walls, not frequent. 1783.

SYN :—Pers. in Ust Ann. 7. p. 27. (1794.) Ach. Syn. 162. *Placodium trichobytum*, Nyl. Prodr. 73. *Colepisma arenarium*, Mudd Man. 138.

FIG :—E. Bot. 1040. Ilffn. Pl. L. t. 58. f. 1. Hepp Sporen t. 22. fig. 199.

EXS :—Zw. 97. Fries 348. Hepp 199. Schær. 632.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2, 3, 4, 5...7.

ENGLAND :—Strumpshaw, Norfolk. *Sir J. E. Smith.* (1783.) Wisbeach, Norfolk. *Mr. Skrimshire.* Maidstone, Kent. *Adm. Jones.* near Shanklin, Isle of Wight. *Mr. Hyndman.* Fairlight near Hastings. *Dr. Holl.* Coggeshall, Essex. *Mr. Varenne.* Pophills, Warwickshire. *Rev. W. S. Rufford.*

WALES :—Conway!

54. *L. Lallavei*, (Clem.) *white*, tartareous, *smooth*, *rimoso-areolate*, sub-lobate at the circumference; apothecia *sub-immersed*, plane, *intensely red*, *scarcely margined*; spores 8, colourless, elliptico-oblong, polari-bilocular.

On calcareous rocks, rare.

SYN :—Clem. Ess. 295. (1807.) Ach. Syn. 45.

EXS :—Anzi Etr. 15. Schær. 584. Mass. 45.

GEOG. DISTRIB :—Europe.

BOT. PROV :—19.

IRELAND :—Lower Glanmire road, Cork. *Mr. Carroll.*

55. *L. phlogina*, (Ach.) *citrine*, effuse, *granulose*, granules dispersed, globular, leprose, (K—); apothecia *yellow-orange*, *waxy*, somewhat convex, *biatorine*; spores 8, colourless, elliptico-oblong, polari-bilocular.

On trees, rare. 1870.

SYN :—Ach. Meth. 180. (1803.) Nyl. Scand. 141.

FIG :—Hepp Sporen t. 44. f. 395.

EXS :—Nyl. 121. Hepp 395.

BOT. PROV :—2.

ENGLAND :—Near Hastings, Sussex. *Rev. J. M. Crombie.* (1870).

## D. Spores 1-septate.

56. *L. isidioides*, (Borr.) greenish-grey or whitish, squamaceous, stellate, squamulae cylindrical, slightly compressed, isidioid, decumbent or ascending, simple or divided, here and there constricted; apothecia dull purplish-or brownish-black, margin tumid, crenulate, often laciniolate; spores 8, fuscous, oblong, 1-septate.

On trees, very rare. 1835.

SYN:—Borrer in E. Bot. Suppl. 2808. (1837.) Mudd Man. 106.

FIG:—E. Bot. Suppl. 2808.

GEOG. DISTRIB:—Europe.

BOT. PROV:—7.

WALES:—Cwm Bychan 2 m. above Llanbedr near Barmouth; Crafnant; Rhaidyr Mowddach. Rev. T. Salwey.

57. *L. sophodes*, (Ach.) grey or cinereo-fuscescent, granulate or granulato-areolate, thin, sub-determinate, (K yellow, C yellow), hypothallus nigricant; apothecia fuscous-black, plane, small, often crowded and angulose, thalline margin entire; spores 8, fuscous, ellipsoid, 1-septate.

On trees and rocks, not unfrequent.

SYN:—Ach. Prodr. 67. (1798.) Syn. 153. Nyl. Scand. 148.

FIG:—E. Bot. 1791. Hepp Sporen t. 9. f. 77.

EXS:—Schær. 314. Hepp 77. 78. 883. 884. Arn. 3. 109. Mudd 109. Körb. 245. Anzi Langob. 304.

GEOG. DISTRIB:—Europe.

BOT. PROV:—2...4, 5...11...15...(19—30).

ENGLAND:—Sussex. Mr. Borrer. Yarmouth. Mr. Turner. Newton-Cap Wood near Bishop Auckland, Durham; Felton Woods, Northumberland. Mr. Winch. Midland Counties. Mr. Purton. Pophills, Warwickshire. Rev. W. S. Rufford. New Forest, Hampshire. Rev. J. M. Crombie.

SCOTLAND:—(saxicole) Coast of Kincardineshire. Rev. J. M. Crombie.

IRELAND:—On rocks and trees, common. Mr. Carroll.

forma *exigua*, (Ach.) whitish or pallido-cinerascent, thin, unequal or sub-granulose, sub-effuse; apothecia crowded, black, small, thalline margin crenulate.

On trees and railings.

SYN:—Ach. Prodr. 69. (1798.) Syn. 151. Nyl. Scand. 150.

FIG:—E. Bot. 1849.

EXS:—Schær. 569. Hepp 207. 882. Zw. 257. Mass. 216. Welw. Lusit. 103.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1, 2, 3, 4...11...15...20...31.

ENGLAND :—Sussex. *Mr. Borrer*. Yarmouth. *Mr. Turner*. Gainford, Durham. *Rev. J. Harriman*. Haldon, Devon. *Mr. Parfitt*. Kelvedon; Coggeshall, Essex. *Mr. Varenne*. Epping Forest. *Rev. J. M. Crombie*.

SCOTLAND :—Coast of Kincairdine. *Rev. J. M. Crombie*.

IRELAND :—Blarney near Cork. *Mr. Carroll*.

CHANNEL ISLANDS :—Jersey; Guernsey. *Mr. Larbalestier*.

forma *lecideoides*, Nyl. crustaceous, albido-cinerascent, macular; apothecia *lecideine*, black, margin brown or obliterated.

On trees and palings.

SYN :—Nyl. Scand. 149,

FIG :—Hepp Sporen t. 10, f. 79. and 80.

EXS :—Hepp 79. 80. Mass. 237. Anzi Langob. 378. Rabh. 737. M. & N. 1331.

GEOG. DISTRIB :—Scandinavia, Italy, Germany, Hungary, Lombardy, Vosges.

BOT. PROV :—5...10.

ENGLAND :—Near Stokesley! Cleveland. *Mr. Mudd*. Middleton! near Oswestry, Shropshire. *Rev. T. Salwey*.

forma *metabolica*, Ach. whitish or albido-cinerascent, disperso-areolate, sometimes granulate; apothecia black, plane or convex, thalline margin sub-entire.

On trees and stone walls.

SYN :—Ach. L. U. 351. (1810.) Syn. 153. Nyl. Prodr. 93.

EXS :—Nyl. 128. Zw. 62. A. B. Fries 341. Anzi Langob. 377. 107. Mudd 107.

GEOG. DISTRIB :—France, Lombardy, Hungary, Germany, Sweden.

BOT. PROV :—2...7...10.

ENGLAND :—Newton! Yorkshire. *Mr. Mudd*. Shanklin, Isle of Wight. *Dr. Holl*.

WALES :—Festiniog Road near Dolgelley!

forma *roboris*, (Duf.) whitish, continuous, effuse, more or less granulose; apothecia large, black, plane, sessile or sub-immersed, thalline margin lobulato-crenate.

On trees.

SYN :—Nyl. Prodr. 93. (1857.) Scand. 149.

EXS :—Maudon 38.

GEOG. DISTRIB :—France, Madeira.

BOT. PROV :—1, 2...5...31.

ENGLAND :—Danny! Sussex. *Herb. Hook*. Torquay! Devon. *Dr. Deakin*. New Forest. *Rev. J. M. Crombie*. Leigh Woods, Clifton. *Mr. Larbalestier*. Llanyblodwell, Shropshire. *Rev. T. Salwey*.

CHANNEL ISLANDS :—St. John's, Jersey, *Mr. Larbalestier*.

58. *L. atrocinerea*, (Dicks.) *atro-cinerascent*, granulato-verrucoso-areolate, smooth, hypothallus black; apothecia at first innate, then sessile, plane, black, thalline margin sub-entire, eventually obliterated; spores 8, fuscous, oblong, 1-septate, cells nucleolate; thallus K yellow C red.

On rocks. 1793.

SYN:—Dicks. Br. Crypt. 3. 14. (1793.) Nyl. Prodr. 93. Mudd Man. 144.

FIG:—Dicks. l. c. t. 9. f. 2. E. Bot. 2096. Hepp Sporen t. 73. f. 646.

EXS:—Nyl. 43. Zw. 68. A. B. 190. A. B. Hepp 646. 208. Leight. 146. Anzi Langob. 321. 45. Arn. 161. Mudd 108. Larbal. 28.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1...5, 6, 7...10...15...19, 20.. 30, 31.

ENGLAND:—On rocks. *Mr. Dickson*. (1793.) near Ayton! Cleveland. *Mr. Mudd*. Crown Hill, Plympton, S. Devon. *Dr. Holl*. Sharpstones; ! Lyth Hill! Shropshire; Pembridge Church Yard! Herefordshire.

SCOTLAND:—Near Aberdeen. *Prof. Dickie*.

IRELAND:—Lough-na-Cat. *Adm. Jones*. Ardglass co. Down. *Dr. Maingay*. Pass of Kein-an-Eigh co. Cork. *Mr. Carroll*. near Bantry. *Miss Hutchins*. Dunkerron. *Dr. Taylor*.

WALES:—Stormy Down, Glamorgan. *Dr. Holl*. Diganwy! near Conway.

CHANNEL ISLANDS:—Ninmont Hill!; Beaufort Bay; La Coupe! Jersey. *Mr. Larbalestier*.

59. *L. nivalis*, (Körb.) *whitish* or *albido-cinerascent*, very thin, or *slightly granulate*; apothecia crowded, *ochraceous* or *aurantiaco-ochraceous*, *biatorine*, plane, small, proper, margin somewhat darker, thalline margin obsolete; spores 8, *cylindraco-oblong* or *cylindrical*, simple or faintly 1-septate; apothecia K dark crimson.

On decaying moss among alpine rocks, rare. 1864.

Externally like *L. fulvolutea*, Nyl.

SYN:—*Callopisma*, Körb. S. L. G. 127. (1855.) *Lecanora fuscolutcolina*, Mudd Man. 153. *Lecanora nivalis*, Nyl. Scand. Suppl. 129.

GEOG. DISTRIB:—Eastern Lapland, Greenland.

BOT. PROV:—15.

SCOTLAND:—Ben Lawers! and Maelgrae! *Adm. Jones*. Ben Cruachan. *Rev. J. M. Crombie*.

60. *L. Hutchinsiae*, Nyl. *pallido-cinerascent* or *flavido-cinerascent*, thin, *rimose* or *rimuloso-diffract*; apothecia *rufu-testaceous*, convex, *biatorine*; spores 8, colourless,



*fusiform*, 1-septate ; *paraphyses thick*, somewhat articulate, hypothecium colourless ; gelatina hymenea cærulescent with sol. iod.

On maritime schistose rocks, rare.

SYN :—Nylander in Flora 1867. p. 326.

GEOG. DISTRIB :—Europe.

BOT. PROV :—19.

IRELAND :—South of Ireland. *Miss Hutchins.*

61. *L. holophæa*, (Mnt.) *cervino-castaneous* or fuscous, cartilagineo-membranaceous, *squamulose*, *squamulæ concave*, *plicato-undulate*, *rotundato-incised*, *ascending*, *flexuose*, pale beneath ; *apothecia* crumpect, appressed, *fuscous-black*, plane, thalline margin naked, very entire ; spores 8, colourless, oblongo-fusiform, 1-septate.

In the fissures of maritime rocks, rare.

SYN :—Montagne Lich. Canar. 113. (1840.) Sylloge 332. Crombie Enum. 48. *Lecidea sublurida*, Nyl. En. Sup. 337.

EXS :—Leight. 380.

GEOG. DISTRIB :—Canaries.

BOT. PROV :—1 . 5...19, 20...24 . 30, 31.

ENGLAND :—Bradstone Church Yard Wall, S. Devon. *Dr. Holl.* on red sandstone, St. James near Bridgnorth, Shropshire !

IRELAND :—Ardglass co. Down *Dr. Maingay*. South of Ireland. *Miss Hutchins.* Island Magee and near Belfast ; Brandon Mountain ! *Dr. Moore*. Glengariff. *Adm. Jones*. Ballycotton, ! Cork ; Sybil Head. Kerry ! Kilkee and Ross, Clare. *Mr. Carroll*.

CHANNEL ISLANDS :—St. Martin's Point, Guernsey. *Mr. Larbalestier*.

Var. *glaucopsora*, Nyl. *squamuloso-crenate*, or *granulato-squamulose*, or sub-leprose ; *apothecia livido-fuscous*, *thalline margin sub-entire* ; spores 8, colourless, fusiform, 1-septate ; thallus K very faint yellow.

Damp sides of old turf pits, rare. 1867.

SYN :—Nylander in Flora 1868. p. 164.

EXS :—Larbal. 79.

GEOG. DISTRIB :—Europe.

BOT. PROV :—31.

CHANNEL ISLANDS :—Sark ; Grosnez Common ! Saint's Bay ; Jersey. *Mr. Larbalestier*.

62. *L. leucospirca*, Nyl. *white*, opaque, *squamulose*, *squamulæ sub-crenate*, thin, *adnate*, *dispersed*, often *granuliform* ; *apothecia fuscous*, sub-opaque, plane, thalline margin white, entire ; spores 8, colourless, oblong or ovoido-oblong, 1-septate.

On sandy earth, rare. 1868.

Allied to *L. holophæa* and its var. *glauco-psora*.

SYN :—Nylander in Flora 1868. p. 473. Crombie Enum. 48.

GEOG. DISTRIB :—Europe.

BOT. PROV :—31.

CHANNEL ISLANDS :—La Moye ; Boulay Bay ; Jersey. *Mr. Larbalestier*.

63. *L. erysibe*, (Ach.) olivaceo-cinereous or virescenti-olivaceous, or darkly cinereous, *leproso-granulose*, *thin*, *diffract* ; *apothecia fusco-rufous* or livido-testaceous, *innate*, plane or convex, *thalline margin rather indistinct* ; spores 8, colourless, linear-oblong, 1-septate.

On rocks, walls, &c. not common. 1861.

SYN :—Ach. Prod. 50, (1798.) Syn. 41. Nyl. Scand. 167. Mudd Man. 141.

FIG :—Hepp Sporen t. 9. f. 75.

EXS :—Mudd 104. 105. 106. Mass. 148. 145. 144. 146. Zw. 269. Hepp 75.

GEOG. DISTRIB :—Sweden, Italy, Germany, Switzerland.

BOT. PROV :—1...3.. 5...10...15...19, 20...23...31.

ENGLAND :—Coatham ! near Ayton ! Redear, Cleveland. *Mr. Mudd*. Bath ! *Mr. Broome*. Devon. *Mr. Parfitt*. Kelvedon, Essex. *Mr. Varenne*. Abdon, ! Shropshire ; Aymestrey ! Herefordshire.

SCOTLAND :—Coast of Kincardine ; Craig Guie. *Rev. J. M. Crombie*.

IRELAND :—Near Dublin. *Dr. Taylor*. Co. Down. *Adm. Jones*. near Cork and near Castlemary ; Turk Cascade, Killarney ; Kilkee. *Mr. Carroll*.

CHANNEL ISLANDS :—Jerbourg, Guernsey ; Noirmont ! Jersey. *Mr. Larbalestier*.

64. *L. dipopsila*, (Whlbn.) *fuscous* or *fusco-cinereous*, *subramoso-papillato-granulate* or *tuberculose*, continuous or radiato-sulcate or crenulate towards the circumference ; *apothecia on the papillæ*, fuscous or fuscous-black or nigricant, plane or sub-convex, thalline margin entire, eventually excluded ; spores 8, colourless, *ellipsoid*, 1-septate.

On maritime rocks, rare. 1808.

SYN :—Wahlenberg in Ach. Meth. Suppl. 36. (1803.) Ach. Syn. 155. Nyl. Scand. 157.

FIG :—E. Bot. Suppl. 2662. f. 2. Wahl. Fl. Lapp. t. 27. f. 2.

EXS :—Th M. Fries 60.

GEOG. DISTRIB :—Finmark, E. Lapland.

BOT. PROV :—11. 15.. 18...20.

ENGLAND :—Bamburgh and Staples Island co. Northumber-

land. (1831.) *Mr. Robertson*. Holy Island, Northumberland. *Mr. Winch*.

SCOTLAND :—Orkney Islands. (1808.) *Mr. Borrer*. Kincardine. *Rev. J. M. Crombie*.

IRELAND :—Kinsale. *Mr. Carroll*.

forma *maritima*, (Smurf.) grey or griseo-nigricant, thin, granulato-rugose, shortly radiose or sub-crenate at the circumference.

On maritime rocks. rare.

SYN :—Sommerfelt in Act. Ac. Holm. 1832. p. 116.

EXS :—Fellm. 122.

GEOG. DISTRIB :—E. Lapland, Norway.

BOT. PROV :—31.

CHANNEL ISLANDS :—Jerbourg, Guernsey. *Mr. Lurbalestier*.

65. *L. helicopis*, (Whlmb.) *albido-cinereous*, thin, unequal, *rimuloso-areolate*, *albo-limitate*; *apothecia livido-fuscescent* or fuscous, plane, sub-convex, *thalline margin entire*, *ultimately excluded*; spores 8, colourless, ellipsoid, simple or obsoletely 1-septate; *thallus K faint yellow*, but not disk of *apothecium*.

On maritime rocks, rare.

The chemical reaction shows affinity with *subfusca* and not with *glaucoma*.

SYN :—Wahlenberg Fl. Lapp. 414. (1812,) Ach. Syn. 149. Nyl. Scand. 159 !

GEOG. DISTRIB :—Lapland, Finmark, Aland.

BOT. PROV :—30.

IRELAND :—On chalk, Glenarm co. Antrim. *Adm. Jones*.

66. *L. albariella*, Nyl. dirty creamy-whitish, tartareous, thin, areolato-diffract, areolæ plane, smoothish; *apothecia fuscous* or fuscous-black, *small*; spores 8, colourless, ovoid, 1-septate; paraphyses distinct; gelatina hymenea *cærulescent*, then violaceo-rubescens with iodine solution.

On maritime chalky rocks, rare. 1864.

SYN :—Nylander Lich. Egypt. p. 5. in Act. Soc. Linn. Bordeaux vol. 25. (1864).

GEOG. DISTRIB :—Egypt.

BOT. PROV :—2.. 30, 31.

ENGLAND :—Beachy Head, Sussex. *Mr. Lurbalestier*. (1864).

IRELAND :—On chalk at Glenarm and at Garton Point co. Antrim. *Adm. Jones*.

CHANNEL ISLANDS :—Island of Bréhou near Sark. *Mr. Lurbalestier*.

E. *Spores 3-septate.*

67. *L. pyreniospora*, Nyl. *grey or cinereo-fuscescent, granulose, thin, sub-effuse; apothecia fuscous-black or black, opaque, thalline margin rugulose or obsoletely crenulate; spores 8, fuscous, ellipsoid, 4-celled, cells nucleolate, (spuriously 1-3-septate.)*

On old wood and turfy earth, rare.

SYN:—Nyl. in *Ofvers. V. Ak. Förh.* 1860. p. 257. note; Scand. 151.

FIG:—Nyl. Scand. t. 1. f. 6.

EXS:—Larbal. 78.

GEOG. DISTRIB:—Sweden, Scandinavia.

BOT. PROV:—31.

CHANNEL ISLANDS:—La Moye, Grosnez, Jersey; Coast of Jethou! *Mr. Larbalestier.*

68. *L. diplinthia*, Nyl. *pallido-cinerascent or pale whitish, thin, unequal or sub-granulose, indeterminate; apothecia fuscous, small, plane, thalline margin entire, internally pallescent; spores fuscous, ellipsoid, large, 4-locular, the two apical cells simple, the central cells either simple or with 2 or 3 transverse cellules; paraphyses scarcely distinct.*

On the earth, very rare. 1868.

SYN:—Nyl. Nov. Gran. p. 30. (1863).

GEOG. DISTRIB:—Nova Granada.

BOT. PROV:—31.

CHANNEL ISLANDS:—Slopes of L'Eperquérie, coast of Sark! *Mrs. Collings.*

69. *L. rubra*, (Hoffm.) *white or glaucous-white, thin, effuse; apothecia rosy or fleshy-red, sub-pruinose, concave, numerous, moderate, thalline margin rugoso-crenulate; spores 8, colourless, oblong or oblongo-ellipsoid, 3-septate.*

On trees and mossy walls. rare.

SYN:—Hoffm. Pl. Lich. 1. 81. (1793.) Ach. Syn. 177. Nyl. Scand. 171.

FIG:—E. Bot. 2218. Hoffm. l. c. t. 17. f. 2. Leight. Ang. Lich. t. 14. f. 1. Hepp Sporen t. 23. f. 205

EXS:—Hepp 205. Nyl. 44. M. & N. 459. Mudd 138. Zw. 67. bis. Leight. 236. Schaer. 319. Mass. 26.

GEOG. DISTRIB:—Switzerland, France, Vosges, Sweden, Bavaria, Prussia, Hungary, Germany, Italy.

BOT. PROV:—1.. 5...10...15...20.

ENGLAND:—Bilsdale! near Rievaulx! Yorkshire. *Mr. Mudd.*

Craig-y-Rhiw! near Oswestry; Wigmore Castle! Herefordshire. *Rev. T. Salwey*. Greta Bridge! Yorkshire. *Mr. Borrer*. Haldon, Devon. *Mr. Parfitt*.

SCOTLAND:—Morrone; Craig Tulloch. *Rev. J. M. Crombie*.

IRELAND:—Fermoy! *Mr. Carroll*.

70. *L. elatina*, Ach. *whitish* or lutescent, leprose, *granulato-pulverulent*, thin, effuse; *apothecia testaceo-fuscescent*, sessile, *plane* or *convex*, *cæsio-pruinose* or *naked*, thalline margin thin, entire, eventually obliterated; spores 8, colourless, acicular or fusiform, 3-septate, curved or flexuose; thallus K yellow C—.

On pine trees and holly, rare. 1869.

SYN:—Ach. L. U. 387. (1810.) Syn. 168. Nyl. Scand. 172.

FIG:—Sturm Deutsch. Fl. t. 20. Hepp Sporen t. 104. f. 911.

EXS:—Th. M. Fries 33. Arn. 66. Hepp. 911. Anzi Ven. 42.

GEOG. DISTRIB:—Austria, Norway, Switzerland, Silesia, Germany.

BOT. PROV:—19.

IRELAND:—On aged Holly in Wood near Derrycuintry, Killarney. (Sept. 1869.) *Mr. Carroll*.

71. *L. athroocarpa*, Dub. *albido-cinereous*, *rimoso-diffract*, unequal, *granulose*; *apothecia densely aggregate*, *deformed*, *fuscous-black*, *cæsio-pruinose*, thalline margin entire; spores 8-16, colourless, elliptico-oblong, obtuse at the apices, 3-septate; thallus K—C—.

On trees.

SYN:—Duby Bot. Gall. 2. 669. (1829.) Nyl. Scand. 168. Crombie En. 53.

EXS:—Nyl. 39.

GEOG. DISTRIB:—Scandinavia, France.

BOT. PROV:—2, 3.

ENGLAND:—New Forest near Lyndhurst. *Rev. J. M. Crombie*. Exeter. *Mr. Parfitt*.

*forma cærulescens*, Mudd. *leaden-grey*, *granuloso-verrucose*, *rugulose*, *rimoso-areolate*; *apothecia pale-brown*, *plane*, *densely cæruleo-pruinose*, thalline margin thick, *undulate*, *angulose*; spores 8.

On walls, &c. rare. 1861.

SYN:—Mudd Man. 140. (1861.) Crombie En. 53.

FIG:—Hepp Sporen t. 72. f. 638.

EXS:—Mudd 103. Korb. 220. Hepp 638. Mass. 276. Arn. 173.

GEOG. DISTRIB:—Germany, Hungary, Italy, Switzerland, Bavaria.

BOT. PROV:—10.

ENGLAND:—Marsk! Cleveland. *Mr. Mudd*. (1861.)



Var. *fuscella*, (Schær.) *albido-cinereous*, very thin, effuse, *nearly evanescent*; *apothecia minute, crowded, fuscous, tumid or biatorine*, slightly pruinose, thalline margin entire, eventually nearly obliterated; spores 8-12.

On trees, frequent.

SYN:—Schärer Spicil. 397. (1823.) Crombie En. 53.

FIG:—Hepp Sporen t. 9. f. 76.

EXS:—Nyl. 40. Zw. 87. Hepp 76. Anzi. It. S. 223. 315. Fellm. 179.

GEOG. DISTRIB:—France, Italy, Switzerland, Hungary, E. Lapland.

BOT. PROV:—2, 3.

ENGLAND:—Sussex! *Mr. Borrer*. Essex! *Mr. Piggott*. New Forest near Lyndhurst. *Rev. J. M. Crombie*.

Var. *metabolica*, (Ach.) *albido-cinerascent*, thin, unequal, *diffRACTO-sub-rimose*; *apothecia minute, black, plane, thalline margin thin, white, eventually fuscous and concolorous with the disk*.

On trees.

SYN:—Ach. L. U. 351. (1810.) Syn. 153. Nyl. Scand. 168. Crombie En. 53.

GEOG. DISTRIB:—France, Scandinavia.

BOT. PROV:—31.

ENGLAND:—"In Anglia forte vulgaris." *Rev. J. M. Crombie*. l. c.

CHANNEL ISLANDS:—Trinity! and Noirmont, Jersey. *Mr. La-balestier*.

### F. *Spores multiseptate*.

70. *L. hæmatomma*, (Ehrh.) *sulphureous* or *albido-flavescent, pulverulent, tartareo-farinose*, effuse; *apothecia scarlet, innate or sub-sessile, moderate, thalline margin thick, flexuose, pulverulent*; spores 8, colourless, acicular or fusiform, 3-7-septate, curved or flexuose; thallus K yellow C yellow.

On rocks, not frequent. 1785.

SYN:—Ehrhart Hanov. Mag. 285. (1783.) Ach. Syn. 178. Nyl. Scand. 172.

FIG:—E. Bot. 223. 486. Hepp Sporen t. 73. f. 641.

EXS:—Zw. 70. Nyl. 45. Schær. 543. M. & N. 638. Mudd 130. Hepp 641. Anzi It. S. 226. Leight. 214.

GEOG. DISTRIB:—France, Norway, Germany, Apennines, Italy, Scandinavia, Sweden.

BOT. PROV:—2, 3, 4, 5...7...10, 11...14, 15...19...30, 31.

ENGLAND:—Stonchenge. *Mr. Dickson*. (1785.) Tunbridge. *Mr. Forster*. Gorleston near Yarmouth. *Messrs. Stone & Turner*. Ay-

ton Moor! Battersby Bank! *Mr. Mudd*. Oswestry! Shropshire. *Rev. T. Salwey*. Hord's Park near Bridgnorth, Salop. *Mr. Purton*. Airyholme Wood! Cleveland. *Mr. Baker*. Gunnerton Crags near Baweston; Heddon-on-Wall; Harlow Hill, Northumberland; Muggleswick Park; High Force; and Winch Bridge in Teesdale and near Egglestone, Durham. *Mr. Winch*. Coggeshall, Essex. *Mr. Vairene*. Pontesford Hill! Nesscliffe Hill! Shropshire.

SCOTLAND:—Salisbury Craigs near Edinburgh. *Sir J. E. Smith*. Blaeberry Hill! Perth; Garrymahine, Lewis; Stennis, Orkney. *Dr. Lindsay*. Morrone; Braemar; Killin; Portlethen, Kincardineshire. *Rev. J. M. Crombie*.

IRELAND:—Near Belfast. *Mr. Templeton*. Dunkerron. *Dr. Taylor*. Glenarm. *Dr. Moore*. Fairhead, Antrim; Castlebernard Park and Glengarriff. *Adm. Jones*. Western Blasquet Island, Kerry. *Mr. Carroll*.

WALES:—Barmouth! *Rev. T. Salwey*.

CHANNEL ISLANDS:—L'etaeq, Jersey; Jerbourg, Guernsey. *Mr. Larbalestier*.

73. *L. ventosa*, (L.) *sulphureo-virescent* or *flavescent* or sometimes whitish or fusco-virescent, *tartareous*, *verrucoso* or *plicato-rugose*, *sub-areolato-diffusact*, determinate, firm; *apothecia* red, plano-convex, large, thalline margin, thin, entire, often obliterated; spores 8, colourless, acicular or fusiform, 5-7-septate, curved or flexuose; thallus K yellow C yellow.

On lofty granitic and schistose mountain-rocks, not common. 1741.

SYN:—*Lin.* Sp. Pl. No. 9. (1753.) *Ach.* Syn. 159. *Nyl.* Scand. 173.

FIG:—*E. Bot.* 906. *Hepp* Sporen t. 73. f. 643. t. 73. f. 644.

EXS:—*Anzi* It. S. 225. *M. & N.* 258. *Schar.* 320. *Hepp* 643.

*Tuck.* 21. *Bohl.* 36. *Zw.* 69. *Mudd* 129. *Leight.* 9.

GEOG. DISTRIB:—Hungary, Italy, Austria, Norway, Tyrol Alps, Pyrenees, Sweden, Switzerland.

BOT. PROV:—5...7...10, 11, 12...15...18...23...29...31.

ENGLAND:—Teesdale, Durham. *Rev. J. Harriman*. Casterton Fell near Kirkby Lonsdale, Westmoreland. *Sir J. E. Smith*. Yorkshire! *Mr. Dixon*. Clee Hills! Shropshire. *Rev. T. Salwey*. Aytton Moor! Kildale! Cleveland. *Mr. Mudd*. Weardale, Durham. Shewing-Shields; Cheviot and Hedgehope, Northumberland. *Mr. Winch*. Corndon Hill! Shropshire.

SCOTLAND:—Morchone! Annulree!; Callernish, Lewis. *Dr. Lindsay*. Morrone, Braemar. *Rev. J. M. Crombie*. Long Island. *Prof. Balfour*.

IRELAND:—Near Dublin. *Dr. Stokes*. Slieve Croob. *Mr. Templeton*. Croghan co. Donegal; Luggelaw. *Adm. Jones*.

WALES:—Penri 3 m. from Glyder. *Mr. Brewer*. (1741). Barmouth! Pen-maen-mawr! Moel-y-Golfa! Cader Idris!

CHANNEL ISLANDS:—Jersey. *Mr. Larbalestier*.

VII. URCEOLARIA, *Ach. pr. p. Nyl.*

Thallus crustaceous. Apothecia urceolate. Spores 8, fuscous, septato-murali-divided. Spermatia cylindrical.

1. *U. scruposa*, (L.) *albido-cinereascent*, tartareous, *verrucoso-rugose* or *granulose*, areolato-diffract, areolæ *verrucoso-rugose*; *apothecia* immersed, *urceolate*, *black*, more or less *cinereo-pruinose*, *proper margin nigrescent*, *thalline margin thick*, *rugose* or *crenulate* on the inner side; spores 8, *virescenti-fuscescent*, ellipsoid, 5-septate, murali-divided; thallus C red.

On rocks, walls, &c. frequent. 1741.

SYN:—Linn. Mant. 2. 131. (1771.) Ach. Syn. 142. Nyl. Scand. 176.

FIG:—E. Bot. 266. Leight. Ang. Lich. t. 11. f. 3.

Exs:—M. & N. 169. Schær. 132. 289. Anzi It. S. 227. 229. Leight. 54. 379. Hepp 915. Fellm. 141. Nyl. 46. Mudd. 137. Mass. 359.

GEOG. DISTRIB:—Switzerland, Germany, Italy, Pyrenees, France, E. Lapland, New Zealand, Ceylon.

BOT. PROV:—3, 4, 5...7, 8...10, 11...19...22, 23, 24...26...31.

ENGLAND:—Norfolk, Suffolk, and Cambridgeshire. *Sir J. E. Smith*. Darkingham, Surrey. *Dillenius* (1741.) Gogmagog Hills; Newmarket Heath. *Rev. R. Belhan*. Loundsdale! Lanbraughrigg! Cleveland. *Mr. Mudd*. near Eglestone; Harewood Forest, between Widdy Bank and Cauldron Snout, Durham. *Mr. Winch*. Duryard, Exeter. *Mr. Parfitt*. Charnwood Forest, Leicestershire. *Rev. A. Bloxam*. Kelvedon, Exeter. *Mr. Varenne*. Midland Counties. *Mr. Purton*. Bedfordshire. *Rev. C. Abbot*. High Rock! near Bridgnorth; Haughmond Hill! Bayston Hill! Lyth Hill! near Shrewsbury! Cold Hatton Heath! Loppington! Shropshire. Stannor Hill! Herefordshire.

IRELAND:—Dunkerron, Kerry; Portmarnock, Dublin. *Dr. Taylor*. Glendalough, Wicklow. *Adm. Jones*. Loughcooter, Galway. *Mr. Carroll*. Killarney. *Mr. Hardy*.

WALES:—Barmouth!

CHANNEL ISLANDS:—Jersey; Guernsey; Sark. *Mr. Larbalestier*.

*forma gypsacea*, (Ach.) *creamy-white*, *thick*, *soft*, *rugoso-unequal*, *sub-pulverulent*, sub-areolate; *apothecia urceolate*, black, *cæsio-pruinose*; *thalline margin tumid*, inflexed; thallus C red.

On calcareous rocks. rare.

SYN:—Ach. L. U. 338. (1810.) Syn. 142.

FIG:—Hepp Sporen. t. 104. f. 916.

EXS:—Anzi Langob. 327. 333. Zw. 76. Mass. 139. Arn. 95. Hepp 916.

GEOG. DISTRIB:—Portugal, Switzerland, Spain, Finland, Tyrol, Italy.

BOT. PROV:—5 ..7...10...12.

ENGLAND:—Cumberland! *Mrs. Stanger*. Kildale! Cleveland. *Mr. Mudd*. Llanymynech Hill! Shropshire.

WALES:—Llyn Cae! Cader Idris.

forma *bryophila*, Ach. *greyish-white* or white, granulo-rugose, *effuse*; apothecia urceolate, immersed, nigro-cæsious, margin tumid, inflexed and crenulate; C red

On mosses and Cladoniæ. rare.

SYN:—Ach. Meth. 148. (1804.) Syn. 10. Nyl. Scand. 177.

FIG:—Hoffm. Pl. L. t. 21. f. 1. Leight. Ang. Lich. t. 11. f. 4. Hepp Sporen t. 23. f. 210.

EXS:—Mass. 150. Anzi It. S. 228. 230. Hepp 210. Schær. 290. M. & N. 170. Nyl. 129. Leight. 359. 360.

GEOG. DISTRIB:—Switzerland, Germany, Sweden, France, Italy, Hungary, Russia.

BOT. PROV:—3 ..5...15 ..19...28...31.

ENGLAND:—Oswestry! *Rev. T. Salway*. Exeter. *Mr. Parfitt*. Kelvedon, Essex. *Mr. Varnue*. High Rock! near Bridgnorth; Church Stretton! Shropshire; Bredon Hills! Leicestershire.

SCOTLAND:—Glen Lochy, Breadalbane. *Rev. J. M. Crombie*.

IRELAND:—Kerry. *Dr. Taylor*. Armagh. *Adm. Jones*. Kileully near Cork. *Mr. Carroll*.

CHANNEL ISLANDS:—Quenvais, Jersey. *Mr. Lurbaletier*.

## VIII. DIRINA, *Fr. Nyl.*

Apothecia tuberculoso lecanorine, hypothecium thick and black beneath. Spores fusiform, 3-septate. Spermatia slender, arcuate.

1. *D. repanda*, (Fr.) *white*, *tartarico-farinose*, thick, continuous or rimulose, tuberculoso-unequal, sub-lobate in the circumference (C red); apothecia at first closed, eventually expanded and dilated, *tuberculoso elevated*, plano-depressed, black, *cæsio- or albo-pruinose*, rarely naked, *margin thick*, obtuse, cartilaginous, more or less inflexed and flexuose; spores 8, colourless, fusiform, 3-septate.

On maritime rocks, rare. 1867.

SYN —Fries S. O. V. 235. (1825.) Nyl. Alger. 313. Prod. 97.

EXS:—Schær. 574. Anzi Venet. 41. Rabh. 788.

GEOG. DISTRIB :—France, Pyrenees, Austria, Sardinia, Algeria, Corsica.

BOT. PROV :—31.

CHANNEL ISLANDS :—La Coupe ! Jersey. *Mr. Larbalestier*.

### SUB-TRIBE VII. PERTUSARIEI.

Characters as in *Pertusaria* below.

### IX. PERTUSARIA, DC.

Thallus crustaceous, continuous, verrucoso-unequal or smooth. Apothecia enclosed in thalline verrucæ, endocarpoid or lecanoroid or variolarioid. Spores 1, 2, 3, 4, 5, 6-8, colourless, ellipsoid, simple, large, the external paries thick. Spermatia acicular.

*A. Thallus K yellow, then orange-red.*

1. *P. multipunctata*, (Turn.) cinereous, tartareous, verrucoso-rugose, thin, with a fibrous border ; apothecia 1-2 in hemispherical verrucæ, ostiola albo-sorediate ; spores 1 (rarely 2), colourless, linear-oblong or elliptico-oblong, simple.

On trees. 1808.

SYN :—Turn. Linn. Trans. 9. 137. (1808.) Ach. Syn. 129. Nyl. Scand. 179. *Variolaria*, Turn. and Borr ! L. B. 73.

FIG :—Linn. Trans. 9. t. 10. f. 1. E. Bot. 2061. Hepp Sporen t. 76. f. 672. 673.

EXS :—Mudd 262. Hepp 672. 673. Zw. 281.

GEOG. DISTRIB :—Sweden, Italy, France, Bavaria, Germany, Philippine Islands, S. Africa.

BOT. PROV :—2, 3 ..6...8...10, 11...19.

ENGLAND :—Sussex ! *Mr. Turner*. (1808.) Brantsdale, Yorkshire. *Dr. Carrington*. New Forest. *Mr. Lyell & Adm. Jones*. Malham, Yorkshire. *Dr. Carrington*. Durham. *Messrs. Rolson and Thornhill*. St. Leonards Forest. *Messrs. Turner & Borrer*. Haldon, Exeter. *Mr. Parfitt*.

IRELAND :—Killarney. *Sir T. Gage*.

WALES :—Cardiganshire ! *Mr. Knight*.

2. *P. Westringii*, (Ach.) greyish or creamy-white, tartareous, thickish, rimoso-areolate, areolæ plane ; verrucæ scattered, flat, contorted and difformed ; ostiola brownish-black, flat, irregular, thalline margin abraded ; spores 2, colourless, elliptical, simple ; thallus K yellow, then orange-red.

On rocks, old walls, &c. 1861.



SYN :—Ach. Act. Stockh. 15. 179. (1794.) Syn. 282. *P. lactescens*. Mudd Man. 272. (1861.) Crombie Enum. 59. *Isidium*, Turn. and Borr. Lich. Brit. 93.

EXS :—Mudd 260. M. & N. 1066. Mass. 86.

GEOG. DISTRIB :—Italy, Vosges, Sweden, France, Switzerland, E. Falkland.

BOT. PROV :—2...7.. 10, 11...23.

ENGLAND :—Ayton Moor! Airyholme Bridge, Cleveland. *Mr. Mudd*. Arkendale! Thornthwaite; near Keswick; Teesdale Forest. *Rev. J. Harriman*. Tunbridge Wells! *Mr. Jenner*.

IRELAND :—Lough Bray near Dublin. *Mr. Turner*.

WALES :—Barmouth! *Rev. T. Salwey*. Anglesea. *Rev. Hugh Davies*.

The chemical reaction and general aspect show that *Isidium Westringii*, Ach. is identical and therefore the original name is restored.

3. *P. glomerata*, (Schleich.) yellowish-cream-colour, effuse, verrucoso-conglomerate, verrucæ globulose, smooth; apothecia 1, ostiola dark-brown, punctiform, depressed or sub-papillate; spores 4, colourless, ellipsoid, simple; thallus *K* yellow, then orange-red.

On mosses in alpine localities, rare. 1864.

SYN :—Schleicher Cent. 3. 77. (1805—1807.) Ach. Syn. 111. Nyl. Scand. 182.

FIG :—Hepp Sporen t. 77. f. 681.

EXS :—Hepp 681. Schær. 120. Arn. 132.

GEOG. DISTRIB :—Norway, Germany, Switzerland, Chili, N. Zealand, Melville Island.

BOT. PROV :—15.

SCOTLAND :—Ben Lawers! *Mr. Carroll*. (1864.) Craig-na-Cailiach, Perthshire. *Dr. Maingay*. Moel Gurdy, Breadalbane. *Rev. J. M. Crombie*.

4. *P. ceuthocarpa*, (Sm.) brownish-cream-colour, tartareous, areolato-diffract, areolæ convex, undulato-rugose; verrucæ sub-globose, conglomerate, ostiola minute, punctiform, depressed, sub-papillate, brownish-black; spores 2, colourless, ellipsoid, simple; thallus *K* deep yellow, then orange-red.

On rocks, not common. 1804.

SYN :—Smith in E. Bot. t. 2372. (1812.) Turn. and Borr. Lich. Brit. 200. *Isidium microsticticum*! T. & B. l. c. 94.

FIG :—E. Bot. 2372. Light. Ang. Lich. t. 9. f. 4. & t. 10. f. 1. E. Bot. 2243.

EXS :—Leight. 284. 341. 342.

GEOG. DISTRIB :—Europe.

BOT. PROV :—5, 6, 7...11...19...23...26 ..31,

ENGLAND:—Pentregaer! near Oswestry. *Rev. T. Salwey*. Gun-  
nerton! Northumberland. *Mr. F. Scott*.

IRELAND:—Connemara. *Mr. Mackay*. near Bantry! *Miss  
Hutchins*. South coasts. *Sir T. Gage*. Lough Bray near Dublin.  
*Messrs Turner & Borrer*. Carig Mountain! *Dr. Taylor*.

WALES:—Barmouth! *Countess of Aylesford*. (1804.) Aberty-  
gwyn! *Rev. T. Salwey*. Hafod, Cardiganshire. *Sir J. E. Smith*.  
Anglesea! *Rev. Hugh Davies*. Holyhead Mountain!

CHANNEL ISLANDS:—St. Brelade's, Jersey. *Mr. LARBALÉSTIER*.

5. *P. dealbata*, (Ach.) whitish or albido-cinerascent, tar-  
tareous, granulose or papillato-unequal, rimoso-diffract;  
apothecia in globose pulverulent scattered or aggregated  
verrucae, ostiola sub-disciform, pale brown, thalline mar-  
gin irregularly lacerate; spores 2, colourless, ellipsoid,  
simple; thallus *K* yellow, then orange-red.

On rocks and trees, frequent.

SYN:—Ach. Prodr. 29. (1798.) Nyl. Scand. 180. *Isidium para-  
doxum!* and *corallinum!* and *coccodes!*  $\alpha$  &  $\beta$  Turn. & Borr!  
Lich. Brit. 97. 100. 89. *Variolaria chlorothecia*, Tayl! Fl. Hib.  
*P. syncarpa*, Mudd! Man. 273.

FIG:—E. Bot. 1541. 1511.

EXS:—Arn. 204. Zw. 289. M. & N. 467. 74. Schær. 236. 237.  
Hepp 673. 678. Mudd 261. Leight. 320.

GEOG. DISTRIB:—France, Switzerland, Germany, Italy.

BOT. PROV:—2, 3, 4, 5...9, 10, 11, 12...14, 15... 19.

ENGLAND:—Kildale Moor! Ayton Moor! Bandale, Cleveland.  
*Mr. Mudd*. Oswestry! *Rev. T. Salwey*. Cumberland! *Mrs. Stanger*.  
Norwich. *Sir W. J. Hooker*. Maresfield and Uckfield, Sussex. *Mr.  
Borrer*. Fornet Church Yard and Burgh Church, Suffolk. *Messrs  
Turner & Borrer*. Selby, Yorkshire. *Mr. Teesdale*. Teesdale Forest.  
and Cronkley Fell, Durham. *Rev. J. Harriman*. Cheshire. *Mr.  
Bradbury*. Flixton Park, Suffolk. *Mr. Turner*. Epping Forest!  
*Rev. J. M. Crombie*. Kelvedon, Essex. *Mr. Varenne*. Caer Caradoc!  
Shropshire.

SCOTLAND:—Blackford near Edinburgh. *Sir J. E. Smith*. Glen  
Callater! *Mr. Gardiner*.

IRELAND:—Carig Mountain; Dunkerron! *Dr. Taylor*. Killar-  
ney. *Sir T. Gage*. Bantry. *Miss Hutchins*. Lough Finnehy! *Dr.  
Taylor*.

### B. *Thallus K* yellow *C* yellow.

6. *P. communis*, DC. albido-cinerascent, membrana-  
ceo-cartilaginous, smoothish or rugose, verrucoso-areo-  
late, verrucae sub-globoso-deformed; apothecia 1 or more,  
ostiola minute, punctiform, depressed, nigricant; spores  
2, colourless, ellipsoid, simple.

On trees, common.

SYN :—D.C. Flor. Fr. 2. 320. (1805.) Nyl. Scan. 178. *Porina pertusa*, Ach. Syn. 109.

FIG :—E. Bot. 677. Leight. Ang. Lich. t. 9. f. 3.

EXS :—M. & N. 171. (in part) Schær. 118 (in part) Zw. 290. Mass. 16. Mudd. 264. Hepp 222. 676. Bohl. 54.

GEOG. DISTRIB :—Europe generally, Madeira.

BOT. PROV :—1, 2, 3...5...10, 11...15...19...30, 31.

ENGLAND :—Torquay! Devon. *Dr. Deakin*. Oswestry! *Rev. T. Salwey*. Sussex! *Mr. Borrer*. Ayton! Cleveland. *Mr. Mudd*. New Forest! *Messrs Turner & Lyell*. Northumberland and Durham. *Mr. Winch*. Haldon, Exeter. *Mr. Parfitt*. Kelvedon, Essex. *Mr. Varenne*. Oversley and Pophills, Warwickshire; Shotover Hill, Oxford, Hord's Park, Salop. *Mr. Purton*. Haughmond Hill! Bomere Pool! Shrewsbury; Aymestry! Herefordshire.

SCOTLAND :—Hunter's Hill, Glammis! *Mr. Gardiner*. Aberfeldy. *Dr. Holl*.

IRELAND :—Blarney! near Cork. *Mr. Carroll*. near Belfast. *Mr. Templeton*. Askew Wood co. Kerry. *Dr. Taylor*.

CHANNEL ISLANDS :—Jersey, Guernsey, Sark. *Mr. Larbalestier*.

forma *rupestris*, DC. verrucæ aggregato-deformed, verrucoso-areolate.

On rocks, common.

SYN :—D.C. l. c. Ach. Syn. 109. Nyl. Scand. 178.

FIG :—Hepp Sporen t. 76. f. 670.

EXS :—Nyl. 48. Mudd 259. Anzi Ven. 164. Hepp 670. Anzi It. S. 348. Zw. 244. Schær. 648.

GEOG. DISTRIB :—Switzerland, Italy, Germany, France, Madeira.

BOT. PROV :—5...7...10...15...19...31.

ENGLAND :—Ingleby Greenbow; Ayton! Cleveland. *Mr. Mudd*. Bristol. *Miss Atwood*.

SCOTLAND :—Birnam! *Dr. Lindsay*.

IRELAND :—Glenarm. *Dr. Moore*.

WALES :—Barmouth!

CHANNEL ISLANDS :—St. Brelade's, Jersey. *Mr. Larbalestier*.

7. *P. dactylina*, (Ach.) *white*, thin, unequal, *papillateo-dactyloid*, stipitate; *apothecia in the apices of the papillæ*; *spores* 1, colourless, ellipsoid, simple.

On moss in alpine districts, rare. 1870.

Nyl. Lapp. Or. 141. says this species has no reaction with K. but Fellm. 144! and also a specimen from Norway give decided reaction K yellow C yellow.

SYN :—Ach. Pezor. 89. (1798.) Nyl. Lapp. or. 140. Crombie En. 60. *Isidium*, Ach. Syn. 282.

FIG :—Ach. Meth. t. 3. f. 6.

EXS :—Fellm. 144.

GEOG. DISTRIB :—E. Lapland, Norway

BOT. PROV :—15.

SCOTLAND:—Morrone; Cairn Ture, in Glen Dee and Glen Candlie, Braemar. *Messrs Brown & Crombie*.

*C. Thallus K yellow C reddish-orange.*

8. *P. bryontha*, (Ach.) white or whitish, thin, effuse, sub-granulato-unequal; apothecia dark-livid, liver colour or fuscous, opaque, lecanoroid, thalline margin ultimately depressed and excluded; spores 1, colourless, ellipsoid, simple.

On moss in alpine places, rare.

SYN:—Ach. Meth. 167. (1803.) Syn. 156. Nyl. Scand. 178. Crombie En. 58.

EXS:—Th. M. Fr. 9. Fellm. 142. Arn. 108.

GEOG. DISTRIB:—Norway, E, Lapland, Germany.

BOT. PROV:—15.

SCOTLAND:—Cairngorm and Bennaboord, Braemar. *Rev. J. M. Crombie*.

9. *P. melaleuca*, (Sm.) yellowish-cream-colour, thin, membranaceous, sub-determinate, smoothish; verrucæ scattered, hemisphærico-depressed, irregular, ostiola brownish-black, pseudo-disciform, depressed, thalline margin lacerate; spores 2, colourless, ellipsoid, simple.

On trees, not common. 1812.

SYN:—Smith in E. Bot. 2461. (1812.) T. & B. Lich. Brit. 183.

FIG:—E. Bot. 2461. Leight. Ang. Lich. t. 10. f. 3.

EXS:—Hepp 935. Anzi It. S. 351. 352. Langob. 223. Zw. 359 Arn. 149. Welw. Lusit. 99. Körb. 268.

GEOG. DISTRIB:—Germany, Italy, Portugal.

BOT. PROV:—2, 3., 7, 8., 24...26.

ENGLAND:—St. Leonards Forest! Henfield! Sussex. *Mr. Borrer*. (1812.) Twycross! Leicestershire. *Rev. A. Bloxam*. Mile-end near Colchester, Essex. *Mr. Varenne*.

IRELAND:—Curraghmore. *Adm. Jones*.

WALES:—Dolgelly!

10. *P. fallax*, (Pers.) albido-flavescent or cinereo-flavescent, sub-effuse, cartilagineo-membranaceous, smooth, plicato-rugose; verrucæ aggregato-deformed, ostiola brownish-black or nigricant, dilated, deformed, sub-lecanoroid, thalline margin thick, undulato-sub-crenate; spores 8, colourless, ellipsoid, simple.

On trees and rocks, not common. 1801.

SYN:—Persoon fide Ach. Syn. 110. (1817.) *Thelotrema lumenum*, Turn. and Borr. L. Br. 185. *Isidium lutescens*, Turn. and Borr. l. c. 87.

FIG.—E. Bot. 1731. & 1529. Leight. Ang. Lich. t. 10. f. 2.

Exs :—Hepp 679. Anzi Etr. 40. Nyl. 49. Mudd 266. Zw. 292. Leight. 71. *Variolose* and *Isidioid* forms :—Anzi Etr. 41. 43. Schær. 238. Hepp 680. Zw. 297. Rock forms :—Anzi It. S. 350. Ven. 165. Schær. 594. 595. Anzi Etr. 42.

GEOG. DISTRIB :—Germany, Switzerland, Italy, Pyrenees, France, Madeira.

BOT. PROV :—1, 2, 3, 4, 5...7...10, 11, 12...19.. 30.

ENGLAND :—Ingleby Park! Airyholme Wood! Cleveland. *Mr. Mudd*. Oswestry! *Rev. T. Salwey*. St. Leonards Forest! Danny! Sussex *Mr. Borrer*. New Forest. *Mr. Lyell*. Hevingham Parsonage, Norfolk. *Rev. J. Alderson*. Epping Forest. *Mr. Foster*. Ockham, Surrey; Hurstpierpoint and Henfield! Sussex; Ickworth Park and near Bramfield, Suffolk. *Mr. Borrer*. Acle Wood, Norfolk. *Mr. Turner*. Westmoreland! *Mr. Winch*. near Eglestone; near Gilside; Horsleyhope Bourn, Durham; East Common Wood and Felton Wood on the Coquet, Northumberland. *Mr. Winch*. Frankling, Exeter. *Mr. Parfitt*. Budleigh Salterton, Devon. *Dr. Dickie*. Braxted; Messing; Yeldham, Essex. *Mr. Varcane*. Pophills and Oversley Hill, Warwickshire. *Mr. Purton*. Caer Caradoc! Haughmond Hill! Sharpstones Hill! Shropshire.

IRELAND :—Blarney! co. Cork. *Mr. Carroll*. Glenarm. *Dr. Moore*. near Belfast. *Mr. Templeton*. Askew Wood co. Kerry; Dunkerron Mountain. *Dr. Taylor*.

WALES :—Barmouth! *Rev. T. Salwey*.

### *D. Thallus K yellow, C crimson.*

11. *P. gyrocheila*, Nyl. cinerascens, sub-granuloso-unequal, rimoso-diffract; apothecia in thelotremoid tubercules, simple or ultimately sub-gyrose, thalline margin thick sub-gyrose, epithecium glypholecine, hymenium pale; spores 8, colourless, ellipsoid, gelatina hyemeneae and thecae blue with iodine.

On alpine rocks, rare. 1864.

SYN :—Nyl. in Flora 1865. p. 354.

GEOG. DISTRIB :—Europe.

BOT. PROV :—15.

SCOTLAND :—Summit of Ben Lawers! *Mr. Carroll*.

### *E. Thallus K—, C crimson.*

12. *P. velata*, (Turn.) milk white or whitish, smoothish or rugoso-unequal, *rimulose*, determinate, *radiato-rugose* or *plicate* towards the circumference, verrucate small, depressed, concolorous; apothecia pale, plane, lecanoroid; spores 1, colourless, ellipsoid, simple, very large.

On trees and rocks, rare. 1808.



SYN:—Turner in Linn. Trans. 9. 143. (1808.) *Variolaria lactea*, Turn. & Borr! L. Br. 69. *Variolaria aspergilla*, T. & B! l. c. 67. *Variolaria conspurcata*, T. & B! l. c. 55. *Isidium coccodes*,  $\beta$ . T. & B! l. c. 89.

FIG:—Linn. Trans. 9. t. 12. f. 1. E. Bot. 2062. *V. aspergilla*, E. Bot. 2401. *V. lactea*, E. Bot. 2410. Ach. Meth. t. 1. f. 6. *V. conspurcata*! E. Bot. 964. Mudd Man. t. 5. f. 114.

EXS:—Maudon 7. Welw. Lusit. 98. Zw. 296. Hepp 677. Bohl. 26. Schær. 596.

GEOG. DISTRIB:—Madeira, Ceylon, Italy, Norway, Martinique, St. Vincent, Ohio.

BOT. PROV:—2, 3, 4, 5...7, 8...11, 12...15...19.. 30.

ENGLAND:—St. Leonard's Forest; Henfield; Itchenor, Sussex. *Mr. Borrer*. New Forest! *Adm. Jones*. Oswestry! *Rev. T. Salwey*. Northern Counties. *Rev. J. Harriman*. Charnwood Forest! Leicestershire. *Rev. A. Bloxam*. Henham; Wrentham; Ickworth; Herringfleet, Suffolk. *Mr. Borrer*. Horsley-hope Bourn. *Messrs. Thornhill & Robertson*. Burgh Castle, Suffolk; Seole Inn, Norfolk. *Mr. Turner*. Cawston Church. *Sir J. E. Smith*. Stoke Wood, Exeter. *Mr. Parfitt*. Braxted, Essex. *Mr. Varenne*. Haughmond Hill! Shomere Moss! Shropshire.

SCOTLAND:—Invercauld; Sidlaw Hills! *Mr. Gardiner*.

IRELAND:—Near Bantry. *Miss Hutchins*. Ballygally Head, Antrim. *Dr. Moore*. Kenmare River. *Dr. Taylor*. Glengariff. *Adm. Jones*. Dromore co. Kerry. *Dr. Taylor*.

WALES:—Anglesea. *Rev. Hugh Davies*. Holyhead!

### F. *Thallus* K—, C rose-colour.

13. *P. faginea*, (L.) glaucous-white, thickish, tartareous, effuse or sub-determinate, brown and zonate at the circumference, smooth, rugose; verrucæ convex, confluent, sorediate, margin narrow, obscure, eventually excluded; spores not seen.

On trees and rocks, common.

SYN:—Linn. Sp. Pl. No. 10. (1753.) Turn. & Borr.! Lich. Brit. 64. *V. illicca*! Lyell! MS. in herb. Borrer.

FIG:—E. Bot. 1713.

EXS:—M. & N. 264. Mudd ?63.

GEOG. DISTRIB:—Arctic America.

BOT. PROV:—2 ..5...10 ..15.. 30.

ENGLAND:—Sussex! *Mr. Borrer*. near Ayton! Cleveland. *Mr. Mudd*. New Forest! *Mr. Lyell*. Haughmond Hill! Shropshire.

SCOTLAND:—Hunter's Hill, Glamis! *Mr. Gardiner*.

IRELAND:—Near Belfast and Devis Mountain. *Mr. Templeton*.

Although I have been unable to detect spores, yet the different chemical reaction indicates this to be distinct.

### G. *Thallus* K—C—.

14. *P. ophthalmiza*, Nyl. greyish, thin, smoothish or

*slightly rugoso-unequal, verrucæ crowded, small, albo-sorediate; apothecia 1 rarely 2 or 3 in each verruca, lecanoroid, nigricant, thalline margin rugose, or sub-leprose; spores 1, colourless, ellipsoid.*

On aged pine trees, rare. 1864.

SYN:—Nyl. Scand. 180. (1861.) Flora 1865. p. 354.

GEOG. DISTRIB:—Europe.

BOT. PROV:—15.

SCOTLAND:—Glenfalloch! Messrs Jones & Carroll. (1864).

15. *P. globulifera*, (Turn.) greyish, cartilagineo-membranaceous, verrucoso-rugose, albo-sorediate, smooth zonate and brown at the circumference; verrucæ large, globular, closed, slightly depressed, lycoperdoid, eventually lacerato-dehiscent, and pseudo-scutelliform, albo-sorediate; spores 1 or 2, colourless, ellipsoid, simple, large.

On trees, rare. 1802.

SYN:—*Variolaria*, Turner in Linn. Trans. 9. 139. (1808.) Nyl. Scand. 180. Turn & Borr. L. Br. 59. Ach. Syn. 130. *V. discoidea*, T. & B. ! l. c. 61.

FIG:—Linn. Tr. 9, t. 10. f. 2. E. Bot. 2008. and 1714.

EXS:—Schær. 597. Bohl. 96. Anzi It. S. 346. 347.

GEOG. DISTRIB:—Europe, Ohio, Tasmania.

BOT. PROV:—2, 3, 4, 5...10...19.

ENGLAND:—Yarmouth; and St. Leonards and Danny! Sussex! Mr. Borrer. (1802.) Craig-y-Rhiw! and Llanforda! near Oswestry. Rev. T. Salwey. New Forest! Adm. Jones. Malham, Yorkshire. Dr. Carrington. Brantsdale; Kildale, Yorkshire. Mr. Mudd. Kelvedon, Essex. Mr. Varenne.

IRELAND:—Castlemartyr Deer Park co. Cork. Mr. Carroll.

16. *P. Hutchinsiae*, (Turn & Borr.) white or cream-colour, thin, effuse, minutely rugoso-unequal; verrucæ small, crowded, deformed, pseudo-disciform; ostiola large, brownish-black, cæsio-pruinose, depressed, margin lacerate; spores 1, colourless, ellipsoid, simple, large.

On moss in alpine districts, rare. 1812.

SYN:—*Thelotrema*, Turn. & Borr. L. Br. 178. (1813).

FIG:—E. Bot. Suppl. 2652. Leight. Ang Lich. t. 11. f. 1.

GEOG. DISTRIB:—Europe.

BOT. PROV:—19.

IRELAND:—Near Bantry! Miss Hutchins. (1812).

17. *P. glomulifera*, (Borr.) whitish, thin, offuso, verrucæ globoso-obovate, smooth; apothecia 1, ostiola small,

*punctiform* or *papillate*, depressed, *nigricant*; spores 4, colourless, ellipsoid, simple.

On moss in alpine places, rare.

SYN :—Leight. Ang. Lich. 30. (1851).

FIG :—Leight. l. c. t. 11. f. 2.

GEOG. DISTRIB :—Europe.

BOT. PROV :—15.

SCOTLAND :—Highlands!! *Mr. Borrer & Dr. Maingay*.

18. *P. pustulata*, (Ach.) grey or greyish olive, smooth, thin, effuse, *contiguous* or *rimose*; *verrucae* scattered, hemispherical, *convex*, small; *apothecia* many, *ostiola* dark brown, *punctiform*, slightly depressed; spores 2, colourless, ellipsoid, simple.

On trees.

SYN :—Ach. L. U. 309. (1810.) Syn. 110. Nyl. Prodr. 195. Leight. Ang. Lich. 30.

FIG :—Leight. l. c. t. 10. f. 4.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1, 2, 3...7... (19—30)...31.

ENGLAND :—Shanklin! Isle of Wight. *Dr. Holl*. Budleigh Salterton, Devon. *Dr. Dickie*. Braxted; Messing; Yeldham, Essex. *Mr. Varenne*.

IRELAND :—Frequent. *Mr. Carroll*.

WALES :—Near Dolgelley!

CHANNEL ISLANDS :—Guernsey! *Rev. T. Salwey*. Quenvais, Jersey. *Mr. Larbalestier*.

19. *P. leioplaca*, (Ach.) glaucous white or pale yellowish-brown, membranaceous, smooth, *verrucae* scattered, *depresso-hemispherical*, large; *apothecia* 1, *ostiola* brownish-black, *punctiform*, slightly depressed; spores 4, colourless, ellipsoid, simple.

On trees, not uncommon.

SYN :—Ach. L. U. 309. excl. var. (1810.) Syn. 110. Nyl. Scand. 181.

FIG :—Hepp Sporen t. 77. f. 675.

EXS :—Hepp 675. Mudd 267. M. & N. 847. Schaer. 119. Zw. 291. A.

GEOG. DISTRIB :—Sweden, Germany, Switzerland, Scandinavia.

BOT. PROV :—2, 3...5...7... 10...15...19...24...26...31.

ENGLAND :—Sowerdale; ! Hoggatts Wood; Airyholme; Cleveland. *Mr. Mudd*. Yoxall Lodge! Staffordshire. *Rev. A. Bloxam*. Sussex! *Mr. Borrer*. Shanklin! Isle of Wight. *Dr. Holl*. Kevedon, Essex. *Mr. Varenne*. Nesscliffe Hill! Weir Coppice! near Shrewsbury.

SCOTLAND :—Braemar. *Rev. J. M. Crombie*. Castleton. *Adm. Jones*.

IRELAND :—Killarney. *Mr. Carroll*. Carraghmore. *Adm. Jones*.  
Castle Taylor, Galway. *Dr. Moore*.

WALES :—Craig Breidden!

CHANNEL ISLANDS :—Quenvais, Jersey. *Mr. Larbalestier*.

20. *P. nolens*, Nyl. *cinereous*, smooth, areolato-rimose, determinate; apothecia *innate*, without thalline prominence, ostiola black, plane, rotundate, oblong or deformed, 2 or more approximate, colourless within; spores 8, colourless, ellipsoid, simple; thecae cylindrical, intensely blue with iodine.

Externally much like *Lecanora cinerea*.

On maritime basaltic rocks, rare. 1864.

SYN :—Nyl. in Flora 1864. p. 489.

GEOG. DISTRIB :—Europe.

BOT. PROV :—30.

IRELAND :—Glenarm co. Antrim! *Adm. Jones*.

#### H. *Thallus* K brownish, C—.

21. *P. fastigiata*, (Turn. & Borr.) albido-cinereous, tartareous, thick, consisting of erect closely juxtaposed simple columns, their apices fastigate, forming an areolate surface, areolæ convex, rough, papillato-sorediate or pulverulent; apothecia 2, 3, 4 or 5; spores not seen.

On siliceous rocks, rare. 1813.

Dr. Taylor Fl. Hib. 2. 114. well describes this lichen his *Variolaria polythecia* as forming large patches on the rocks, "conspicuous by the crowded and stalked apothecia, placed in contact, like certain basaltic columns." His specimens in the Hook. Herb. at Kew are perfectly identical with the authentic specimens of *Isidium oculatum*,  $\beta$  *fastigiatum* of T. & B. Lich. Brit. 103. in the Borrer Herb. A vertical section shewed sufficient to enable us to regard this a *Pertusaria*, although the microscope failed to discover the spores.

SYN :—*Isidium oculatum*  $\beta$  *fastigiatum*, Turn. & Borr. ! Lich. Brit. 103. (1813.) *Variolaria polythecia*, Tayl ! Fl. Hib. 2. 114.

BOT. PROV :—19 ..26.

IRELAND :—Connamara *Mr. Mackay*, near Bantry! *Miss Hutchins.* Dunkerron! *Dr. Taylor*, Boars Head Rocks! *Mr. Borrer*.

22. *P. sublactea*, Leight. creamy-yellow, tartareous, thin, undulato-rugose, very slightly rimose; apothecia scattered, distinct, elevated, depresso-convex, albo-sorediate; spores unknown.

On siliceous rocks, rare. 1813.

This occurs as a single specimen in Borrer Herb. at Kew, under the name of *Variolaria lactea*. *V. lactea* and its var. *arcuaria* T. & B! Lich. Brit. 69. have reaction K—C crimson and are re-

ferable as states of *P. velata*, Turn. The present lichen has a totally different reaction K pale brownish yellow C— and is no doubt the plant spoken of in the Lich. Brit. p. 72.

SYN :—Turn. & Borr. Lich. Brit. 72. (1813).

GEOG. DISTRIB :—Europe.

BOT. PROV :—19.

IRELAND : !—*Miss Hutchins & Sir Thos. Gage.*

## X. PHLYCTIS, Wallr.

Thallus slightly crustaceous, continuous or pulverulent. Apothecia erumpent, rotundato-difformed, thalline margin indistinct. Spores 1-2, colourless, ellipsoid or oblong, murali-divided, large. Spermatia short, slender, straight.

1. *P. agelæa*, (Ach.) whitish or albo-canescant, thin, subdeterminate or effuse, rugose or sub-leprose or sublævigate, rimoso-diffract; apothecia irregular, depressed, scattered or crowded, nigricant, albido-or cæsio-suffused, thalline margin leprose, inflexed, irregularly crenate; spores 2, luteo-fuscescent, ellipsoid, murali-divided, apically mucronate; thallus K yellow, then orange.

On trees, frequent. 1807.

SYN :—Ach. Prod. 30. (1798.) Syn. 117. Nyl. Scand. 184. *Variolaria*, Turn. & Borr! Lich. Brit. 78.

FIG :—E. Bot. 1730. Hepp Sporen t. 80. f. 703.

EXS :—Nyl. 54. Hepp 703. Mudd 269. Anzi It. S. 345. Rabh. 807. Mass. 206. Zw. 298. Leight. 282.

GEOG. DISTRIB :—Italy, Germany, Bavaria, France, Switzerland.

BOT. PROV :—2, 3, 4, 5...10...19...24...26...31.

ENGLAND :—Yarmouth! *Mr. Turner.* (1807.) Sussex! *Mr. Borrer.* Hoggarts Woods! Ingleby; Airyholme Wood! Kildale; Yorkshire. *Mr. Mudd.* Hatfield Broad Oak; Braxted, Essex. *Mr. Varenne.* Pophills, Warwickshire. *Rev. W. S. Rufford.* Epping Forest; New Forest. *Rev. J. M. Crombie.* Haughmond Hill! Shropshire.

IRELAND :—Castlebernard Park, Bandon. *Adm. Jones.* Castle Taylor, Galway. *Dr. Moore.* Kitsboro'; and Riverstone, Cork. *Mr. Carroll.*

CHANNEL ISLANDS :—Jersey, Guernsey. *Mr. Larbalestier.*

2. *P. argena*, (Ach.) silvery-grey or cream-colour, thin, effuse, rugose or sublævigate, pulverulent; apothecia orbicular, scattered or crowded, depressed, pulverulent, brown, cæsio-pruinose, thalline margin rugose, inflexed; spores 1, luteo-fuscescent, narrow-oblong or



*cylindraceo-oblong, 5-septate, murali-divided, very large; thallus K yellow, then red.*

On trees, frequent. 1808.

SYN:—Ach. Prodr. 8. (1798.) Meth. 74. Syn. 47. Nyl. Scand. 184. *Variolaria*, Turn. & Borr. ! L. Br. 75.

FIG:—Hepp Sporen t. 80. f. 75.

EXS:—Hepp 705. Zw. 299. Rabh. 806.

GEOG. DISTRIB:—Switzerland, Germany.

BOT. PROV:—2. 8. 10.

ENGLAND:—Sussex! *Mr. Borrer*. Kildale, Cleveland. *Mr. Mudd*. Charnwood Forest! Leicestershire. *Rev. A. Bloxam*. New Forest and near Exeter. *Rev. J. M. Crombie*.

### SUB-TRIBE VIII. THELOTREMEI.

Apothecia verrucæform, open. Spores 8, murali-divided.

### XI. THELOTREMA. *Ach.*

Thallus slightly crustaceous, continuous. Apothecia verrucæform, at first closed, then open, ostiolum rotundo-poriform, margin double, external or thalline one thin, even, internal or proper one membranaceous, lacero-dehiscent, disk urceolate, depressed; spores 8, colourless, fusiform, murali-divided.

1. *T. lepadinum*, Ach. whitish or yellow cream-colour, sub-effuse, smooth or slightly ruguloso-unequal; apothecia hemispherical, scattered, ostiolum round, open, margin even; disk urceolato-scutelliform, dark-brown, cæcio-pruinose or naked, proper margin lacerate, inflexed; spores 8 colourless, oblongo-fusiform, murali-divided.

On trees, rarely on rocks, frequent. 1800.

SYN:—Ach. Prodr. 30. (1798.) Syn. 115. Nyl. Scand. 185. Turn. & Borr. ! Lich. Brit. 180.

FIG:—E. Bot. 678. Leight. Ang. Lich. t. 12. f. 1.

EXS:—Schær. 121. Bohl. 29. Mudd 268. M. & N. 257. Zw. 352. Nyl. 50. Hepp 948. Leight. 121.

GEOG. DISTRIB:—Sweden, Norway, Switzerland, France, Germany, Spain, Guyana, N. Zealand.

BOT. PROV:—2, 3, 4, 5, 6, 7, 10, 11...15...(19—30).

ENGLAND:—Eglestone and Teesdale Forest, Durham. *Rev. J. Harriman*. (1800.) Sussex! *Mr. Borrer*. King's Wood, Roche Abbey! Yorkshire. *Mr. Bohler*. near Old Ryland! Yorkshire. *Mr. Baker*. Baysdale! Airyholme! Hob Hole! Cleveland. *Mr. Mudd*. near Beverley. *Mr. Teesdale*. Studley Woods, Yorkshire. *Mr. Brun*.

ton, New Forest. *Mr. Lyell*. Costesey near Norwich. *Sir W. J. Hooker*. St. Leonard's Forest and near Tunbridge Wells. *Messes. Turner & Borrer*. Gilside; Ravensworth and Cawsey Woods, Durham; Bearl Wood; East Common Wood and Felton Woods, Northumberland. *Mr. Winch*. Stoke Wood, Exeter. *Mr. Parfitt*. Haughmond Hill! Shropshire.

IRELAND :—Common on trees, rare on rocks. *Mr. Carroll*.

WALES :—Hafod, Cardiganshire. *Sir J. E. Smith*. Cors-y-gedol! *Rev. T. Salwey*. Dolgelley!

SCOTLAND :—Loch Katrine, Breadalbane. *Rev. J. M. Crombie*.

forma rupestre, T. & B. deep yellow or ochrey, tartareous, dispersed; apothecia deformed, crowded, ostiolum dilated, thalline margin tumid, disk darker brown; spores 1-2.

On rocks, not common. 1813.

SYN :—Turn. & Borr. Lich. Brit 180. (1813.) Leight. Ang. Lich. 32, var. *scutelliforme*, Ach. L. U. 313. Syn. 115.

FIG :—Leight. Ang. Lich. t. 12. f. 2.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2...7...11.

ENGLAND :—Teesdale, Durham. *Rev. J. Harriman*. Sussex. *Mr. Borrer*.

IRELAND :—Dunkerron! *Dr. Taylor*.

WALES :—Llyn Bodlyn! *Rev. T. Salwey*.

2. *T. subtile*, Tuck. whitish or milky-white, macular, somewhat shining; apothecia erumpent, small, white, thalline margin slightly prominent, proper margin albo-pulverulent; spores 8, colourless, oblong, 10-13-celled.

On young oaks and birch, very rare. 1864.

SYN :—Tuck. Suppl. 1. 426. (1858.) Nyl. in Flora 1854. p. 491.

GEOG. DISTRIB :—Europe, N. America.

BOT. PROV :—19. 29.

IRELAND :—Lough Inchiquin co. Kerry; Croghane, Turk Mountain, and Cromaglow, Killarney; near Derryeundry and at the Eagles Nest. *Mr. Carroll*. (1864.) Glengariff. *Adm. Jones*. Glenveigh co. Donegal. *Dr. Moore*.

## TRIBE XV. LECIDEINEI.

### I. LECIDEA. *Ach. Nyl.*

Thallus crustaceous, various, squamose, granulose, areolate, powdery or evanescent. Apothecia patellulate, discolored (not black) and biatorine, or black and lecidine, with proper margin, often obliterated, or urceolate and gyalectine. Spermatia acicular, straight or crenate, or shortly cylindrical.

## A. Spores simple.

\* *Thallus squamulose or verrucoso-squamulose.*† *Hypothecium pale or colourless.*

1. *L. decipiens*, Ehrh. reddish-flesh-coloured, squamose, squamules appressed, rotundo-lobate or crenate, flat-tish, smooth, scattered, margins sub-flexuose, upturned, white as well as the under surface, (K—C—); apothecia marginal, adnate, plano-convex, black, margin thin, entire, soon obliterated; hypothecium pale; spores 8, colourless, ellipsoid, simple.

On the earth among calcareous rocks, not common.

SYN:—Ehrhart in Hedw. Stirp. Crypt. 2. 7. (1789.) Ach. Syn. 52. Nyl. Scand. 214.

FIG:—E. Bot. 870. Hepp Sporen t. 14. f. 120.

EXS:—Anzi It. S. 240. Anzi Ven. 56. Welw. Lusit. 95. Mass. 70. M. & N. 58. Schær. 164.

GEOG. DISTRIB:—Italy, Switzerland, Pyrenees, Sweden, Bavaria, Portugal, Algeria, Texas.

BOT. PROV:—4. 7...11...15.

ENGLAND:—Gogmagog Hills, Cambridge. Rev. R. Relhan. Teesdale, Durham. Rev. J. Harriman.

SCOTLAND:—Highlands. Messrs. Stuart & Don. Ben Lawers. Dr. Maingay. Killin and Clova. Rev. J. M. Crombie.

WALES:—Gogarth! Great Orme's Head.

2. *L. Salweii*, Borr. whitish or creamy white, tartareous, effuse or continuous, squamulose, squamules depressed, tumid or granulose, bluntly lobed, appressed, unpolished, minutely innato-granulate, (K yellow C red); apothecia sessile, solitary or clustered, plane, lurid umber-brown, pruinose, margin paler, thin, elevated, flexuose, hypothecium pale; spores 8, colourless, ellipsoid, simple, large.

On earth among rocks, frequent. 1825.

SYN:—Borrer! in E. Bot. Suppl. 2861. (1841).

FIG:—E. Bot. Suppl. 2861.

EXS:—Zw. 78. Anzi Langob. 171. Larbal. 32.

GEOG. DISTRIB:—Germany, Switzerland, Lombardy, Arctic America.

BOT. PROV:—1, 2.. 7...19.. 31.

ENGLAND:—Near Seamen, Cornwall. Mr. Ralfe. Valley of Rocks at Linton, N. Devon! Mr. Borrer, near Penzance. Mr. Curnow. Plymouth. Mr. Holmes.

IRELAND:—Priest Leap Mountain near Dunkerron. Dr. Taylor.

WALES:—Craig Breiddin, Montgomeryshire. (1825); near Drws y

Nant Isaf; Road from Bala to Dolgelley; Gelli-rhûdd near Barmouth. *Rev. T. Salwey*. Twll-dû. *Mr. Borrer*.

CHANNEL ISLANDS:—Guernsey! *Rev. T. Salwey*. Beauport Bay, Jersey! *Mr. Larbalestier*.

3. *L. atro-rufa*, (Dicks.) *lurido-cinerascent* or brownish, *adnato-squamulose squamules depressed*, or *sub-verrucose* or *sub-imbricate*, (*K—C—*); *apothecia fuscous* or *nigricant*, *adnate*, *plano-convex*, margin thin, soon obliterated, *hypothecium colourless*; spores 8, colourless, ellipsoid, simple.

On earth among sub-alpine rocks, not unfrequent.

SYN:—Dicks. Br. Crypt. 4. 22. (1810.) Ach. Syn. 51. Nyl. Scand. 198.

FIG:—E. Bot. 1102. Hepp Sporen t. 15. f. 122.

EXS:—Hepp 122. Th. M. Fries 41. Schaer. 171. Fellm. 151. Anzi It. S. 238.

GEOG. DISTRIB:—Germany, Sweden, Switzerland, Austria, E. Lapland, Hungary, Italy.

BOT. PROV:—5...7...10, 11, 12...19...22...31.

ENGLAND:—Penrith Fell, Cumberland. *Mr. Dickson*. (1801.) Eglestone! Durham. *Rev. J. Harriman*. Farndale Moor, Yorkshire. *Mr. Mudd*. Caer Caradoc! Shropshire.

SCOTLAND:—Ben Lawers; Lochnagar; Ben Macdhuì; Benna-board. *Rev. J. M. Crombie*. Ben Lawers; Crainlarich. *Dr. Holl*.

IRELAND:—Mount Douce, Wicklow. *Adm. Jones*.

WALES:—Cwm Glas! Snowdon.

CHANNEL ISLANDS:—Guernsey. *Rev. T. Salwey*.

4. *L. globifera*, (Ach.) *fusco-rufous* or *castaneo-rufescent*, *squamose*, *squamules reniform*, *imbricated*, *rigid*, somewhat shining, *rimoso-inculpted*, lobate, flexuose, subhorizontal, *thickened at the margins*, concolorous beneath; *apothecia fuscous* or black, *convex*, immarginate, pale within, solitary or aggregate; spores 8, colourless, ellipsoid, simple.

On earth in sub-alpine localities, rare.

SYN:—Ach. L. U. 213. (1810.) Syn. 51. Nyl. Scand. 193.

FIG:—Hepp Sporen t. 57. f. 489. Sturm D. Fl. t. 26.

EXS:—Zw. 8. Hepp 489. Schaer. 158. Th. M. Fries 40. Anzi Langob. 263.

GEOG. DISTRIB:—Scandinavia, Norway, Bavaria, Switzerland, Lombardy.

BOT. PROV:—14.

SCOTLAND:—Arthur's Seat, Edinburgh; Pentland Hills. *Dr. Maingay*.

forma *rubiformis*, (Whlnb.) *squamules* pale brown, *margins* and under surface *whitish*.

On the earth in alpine places, rare. 1864.

SYN :—Whlnb. Fl. Lapp. 479. (1812.) Ach. Syn. 42. Nyl. Scand. 193.

EXS :—Th. M. Fries 39. Anzi Langob. 137.

GEOG. DISTRIB :—Norway, Lombardy.

BOT. PROV :—15.

SCOTLAND :—Summit of Ben Lawers ! *Mr. Carroll*.

5. *L. rhizobola*, Nyl. *castaneo-fuscous* or *lurido-fuscescent*, *squamose*, *squamules rigid*, *rotundate* or *rotundato-deformed*, crenate at the margin, under surface pale or whitish, unequal, *with long central radicles* ; apothecia nigricant, moderate, pale within ; spores 8, colourless, oblongo-ellipsoid, simple ; paraphyses indistinct ; gelatina hymenea vinous red with iodine.

On the earth among rocks in alpine districts, rare. 1865.

Allied to *L. globifera*.

SYN :—Nyl. in Flora. 1865. p. 4. Crombie En. 64.

GEOG. DISTRIB :—Europe.

BOT. PROV :—7 ..15.

SCOTLAND :—Ben Lawers. *Adm. Jones*.

WALES :—Glyder Vach, Snowdonia.

6. *L. glaucolepidea*, Nyl. *glauco-virescent*, membranaceous, *squamulose*, *squamules* scattered, *ascending*, rounded, *margins inciso-lobate* and *crenate*, *sorediiferous* ; apothecia large, adnate, solitary, *reddish-black*, *convex*, or cephaloid, depressed in the centre, margin obliterated ; hypothecium thick, pale brown ; spores 8, colourless, ovate or elliptical, simple.

On mountain turfy ground, rare. 1812.

Thallus like a *Cladonia*.

SYN :—Nyl. Enum. Gen. Suppl. 337. (1857) Carroll in Nat. Hist. Rev. 1859. p. 326. Mudd Man. 171.

FIG :—Nat. Hist. Rev. 1859. t. 32. f. 2. 3. a. b. c.

GEOG. DISTRIB :—Europe.

BOT. PROV :—19...30.

IRELAND :—Near Bantry. *Miss Hutchins*. (1812.) South side of Crochan Mountain ! 4 m. from Ballintoy co. Antrim. *Dr. Moore*.

7. *L. armeniaca*, (DC.) *pale ochraceo-lutescent*, *areolato-diffract*, *areolae sub squamoso verrucose*, plane or subconvex, *smooth*, hypothallus black ; apothecia in-



nate, nearly plane, immarginate, moderate; hypothecium dusky or colourless; spores 8, colourless, ellipsoid or oblong, simple; thallus K orange yellow, C red.

On rocks, rare.

SYN:—*L. armeniaca* var. *aglaoides*, Nyl. Delp. in Bull. Soc. Bot. Fr. vol. 10. p. 265. (1863) Crombie Enum. 83.

GEOG. DISTRIB:—Europe.

BOT. PROV:—15.

SCOTLAND:—Craig Calliach, East Grampians. *Rev. J. M. Crombie*.

8. *L. nigro-glomerata*, Leight. *albido-glaucouscent, sub-areolate, squamulose, squamules very small, confluent* around the glomerations of apothecia, otherwise dispersed, *adnato-appressed, plano-convex or depressed, smooth and shining, crenulate, (K yellow C yellow)*; hypothallus black, appearing only on the margins of the squamules: *apothecia black, large, numerously conglomerate, deformed by close proximity, shining, convex, internally colourless, margin thickish, slightly paler, prominent, flexuose: hypothecium colourless, with only a small dusky-blackish lateral excipulum, which is often continuous under the colourless hypothecium as a thin dusky line; paraphyses crowded, distinct; spores 8, colourless, ellipsoid, simple, moderate.*

On alpine quartzose rocks, very rare. 1870.

Approaching *L. rusticula*, Nyl. in general habit and appearance, but that is a much more minute lichen, with a granular thallus and fuscous hypothecium. Externally with a general resemblance to *L. diducens*, Nyl., but distinct by the character of the squamulose thallus, the colourless hypothecium, the larger spores, and the apothecia being internally colourless.

GEOG. DISTRIB:—Europe.

BOT. PROV:—15.

SCOTLAND:—Ben-y-Gloe. *Rev. J. M. Crombie*. (1870).

### †† *Hypothecium dark.*

9. *L. lurida*, (Swartz.) *lurido-fuscescent, imbricato-squamose, squamules rigescent, sub-horizontal, sub-orbicular, smooth, sinuato-lobate, under surface white; apothecia nigro-fuscous, adnate, plane or convex, margin thin, flexuose, soon obliterated; hypothecium thick, dark-brown; spores 8, colourless, ellipsoid, simple.*

On earth among calcareous rocks. 1793.

**SYN** :—Swartz Nov. Act. Upsal. 4. 247. (1784.) Ach. Syn. 51. Nyl. Scand. 192.

**FIG** :—E. Bot. 1329. Sturm D. Fl. t. 27. Hepp Sporen t. 14. f. 121.

**EXS** :—Anzi It. S. 239. Dicks. 25. Mass. 67, 68. Nyl. 131. M. & N. 643. Hepp 121. Schær. 157. Larbal. 31.

**GEOG. DISTRIB** :—Sweden, Italy, Pyrenees, Hungary, France, Switzerland, Bavaria, Algeria.

**BOT. PROV** :—1.. 12...15...23 ..26...31.

**ENGLAND** :—Cumberland. *Mr. Dickson*. (1793.) Eglestone, Durham. *Rev. J. Harriman*. Middleton! Teesdale. *Mr. Robertson*. Babbicombe! *Mr. Borrer*. Buxton; Malham. *Dr. Carrington*. Bathford Hill, Bath. *Dr. Holl*.

**SCOTLAND** :—Ben Lawers. *Adm. Jones*. Craig Guie. *Rev. J. M. Crombie*.

**IRELAND** :—Glasnevin!; near Galway. *Dr. Moore*.

**CHANNEL ISLANDS** :—On Janvrin's Tomb; Portelet Bay, Rozel, Jersey!; near Gouliot Caves, Sark; Rocquarie Hill, Guernsey. *Mr. Larbalestier*.

10. *L. Friesii*, Ach. *brownish-olive*, cartilaginous, diffuse, *glebuloso-squamose*, *squamules scattered or crowded*, *convexo-gibbous*, *smooth and polished*; apothecia black, prominently sessile on the squamules, margin thickish, flexuose and incurved; hypothecium dark-brown; spores 8, colourless, ellipsoid, simple, minute; thallus K—C orange.

On trees and palings, rare. 1854.

**SYN** :—Ach. in Liljeb. Sv. Fl. p. 610. (1816.) Nyl. Scand. 213. *L. mormecina*, Fr. L. Ref. 344. *L. Caradocensis*, Mudd (non Leight.) Man. 169.

**FIG** :—Ann. and Mag. N. Hist. ser. 3. 14. t. 9. f. 8. 9. 11.

**EXS** :—Mudd 142. Fries 28.

**GEOG. DISTRIB** :—Sweden,

**BOT. PROV** :—10.

**ENGLAND** :—Farnedale! Stogdale! Kildale! Baysdale! Cleveland; Yorkshire. *Mr. Mudd*.

11. *L. ostreata*, (Hffm.) *pale olive*, *squamulose*, *squamules imbricate*, *ascending or sub-erect*, *reniform*, *smooth*, *crenate*, *margins and under surface albo granulato pulcrulent*; apothecia black, opaque, plane, adnate, slightly glaucopruinose, margin flexuose; hypothecium fuscous; spores 8, colourless, ellipsoid, simple, minute; thallus K—C crimson.

On trees and palings, frequent. 1805.

SYN:—Hoffm. D. Fl. 2. 163. (1795.) Nyl. Scand. 242. *L. scalaris*, Ach. Syn. 52.

FIG:—E. Bot. 1501.

EXS:—Zw. 77. Mudd 141. Anzi It. S. 236. M. & N. 1326. Schær. 467. Leight. 56.

GEOG. DISTRIB:—Germany, Sweden, Bavaria, E. Lapland, Italy, Austria, Switzerland, Scandinavia.

BOT. PROV:—3, 4, 5...10.

ENGLAND:—Near Halesworth, Suffolk. *Mr. Turner*. Eton. *Mr. Gotobed*. Henham, Suffolk. *Mr. Turner*. Oggeray Gill!; Westerdale! Cleveland. *Mr. Mudd*. Thorndon Hall Park! Essex. *Mr. Piggott*. Hay Park! Herefordshire. *Rev. T. Sulwey*. Ursenby! Yorkshire. *Mr. Baker*. near Worcester. *Dr. Holl*. Hendon; Finchley; Hampstead; Epping; Totteridge; near Lyndhurst, New Forest. *Rev. J. M. Crombie*. Caer Caradoc! Eastern base of Wrek-in! Shropshire.

12. *L. mamillaris*, (Gouan) *white*, thick, tartareous, verrucoso-or areolato-squamulose, areolæ sub-lobato-plicate, turgid and convex, cancellato-insculpted or rimose; apothecia on the margins of the areolæ, sessile, black, plane, naked, margin thin, eventually obliterated; hypothecium nearly black, thick; spores 8, colourless, elongato-ellipsoid, simple or obscurely bilocular; thallus K—C—.

On calcareous rocks, rare. 1791.

SYN:—Gouan Montp. 88. (1796.) Nyl. Prodr. 120.

FIG:—Linn. Trans. 1. t. 4. f. 3.

EXS:—Schær. 575. Mass. 29. Anzi It. S. 245.

GEOG. DISTRIB:—France, Algeria.

BOT. PROV:—1.

ENGLAND:—Babbicombe, Devon. *Adm. Jones*. Upton! near Torquay, Devon. *Dr. Deakin*.

13. *L. intumescens*, (Flot.) *fusco-cinereous* or *cervino-fuscescent*, determinate, sub-squamoso-plicato-verruculose, areolato-diffract; apothecia black, numerous, crowded, minute, innato-appressed, plane, margin thin, prominent, flexuose; hypothecium nigro-fuscous; spores 8, colourless, ellipsoid, simple.

In insulated patches between the thallus of *Lecanora glaucoma* on rocks, frequent. 1854.

SYN:—*L. badia* v. *intumescens*, Flot. Lich. Siles. No. 175. (1829.) Nyl. Scand. 231. *L. insularis*, Nyl. Bot. Not. 1852. p. 177.

FIG:—Mudd Man. t. 3. f. 76.

EXS:—Nyl. 58. Leight. 161. Mudd 174. Rabh. 749. Anzi Langob. 330.

GEOG. DISTRIB:—France, Sweden, Austria, Westphalia.

BOT. PROV:—5...10...15.

ENGLAND :—Cliffrigg ! Lounsdale ! Cleveland. *Mr. Mudd.* Oakham Dingle ! near Church Stretton ; Pontesford Hill ! Caer Caradoc ! Shropshire.

SCOTLAND :—Portlethen, Coast of Kincardineshire. *Rev. J. M. Crombie.*

14. *L. lugubris*, Smmr. *fusco-cinereous, cartilaginous, thickish, squamuloso-areolate, granuloso-concrete, glebuloso-diffract ; apothecia black, opaque, superficial, plane, margin thick, entire, hymenium cinerascens ; hypothecium nigro-fuscous ; spores 8, colourless, sphaerical, simple, minutely multi-nucleolate.*

On sub-alpine rocks, rare. 1856.

SYN :—Sommerfelt Suppl. Fl. Lapp. 143. pr. p. (1826.) Nyl ! Obs. Holm. 176. Scand. 232. 293. Lindsay in Micr. Journ. 5. 177.

FIG :—Micr. Journ. 5. t. 11.

EXS :—Fries L. S. 351. Mudd 183. Th. M. Fries 19.

GEOG. DISTRIB :—Sweden, Norway, Finland, Bavaria, Prussia.

BOT. PROV :—10...15.

ENGLAND :—Old wall east of Cook's Monument ! Ayton, Cleveland. *Mr. Mudd.* Cronkley Scar, Yorkshire. *Mr. Martindale.*

SCOTLAND :—West of village of Braemar co. Aberdeen. *Dr. Lindsay.* (1856.) Ben Lawers ! *Mr. Hugh Macmillan.* Castleton ! Braemar. *Adm. Jones.* Foot of Ben-y-gloe ; Glen Fender ; Blair Athole. *Rev. J. M. Crombie.*

15. *L. fuliginosa*, Tayl. *dark-brown or fusco-rufescent, glebuloso-squamulose, pulvinulo-conglomerate, hypothallus nigro-fuscous, sub-byssoid ; apothecia black, small, solitary or aggregate, plano-convex, margin thin, soon obliterated, internally blackish ; hypothecium brownish-black, thick ; spores 8, colourless, ellipsoid, simple, minute.*

On rocks, frequent. 1836.

SYN :—Tayl. ! Fl. Hib. 2. 131. (1836.) *L. confusa*, Nyl. Scand. 216.

EXS :—Leight. 305.

GEOG. DISTRIB :—Sweden.

BOT. PROV :—5...7.. 15...19.

ENGLAND :—Caer Caradoc ! High Rock ! near Bridgnorth, Shropshire.

SCOTLAND :—Crianlarich. *Dr. Holl.*

IRELAND :—Dunkerron ; Carig ! Mountains ! co. Kerry. *Dr. Taylor.* (1836.) Glengarriff ; Dunmanway ! *Mr. Carroll.*

WALES :—Between 4 & 5 milestone between Barmouth and Dolgelly ! *Rev. T. Salway.* Barmouth ! Cader Idris !

\*\* *Thallus scurfy.*

16. *L. advertens*, Nyl. *olivaceo-nigricans, indetermi-*

nate, thin, *furfuraceous*, *byssoid*; *apothecia* black, *minute*, at length sub-convex and immarginate, concolorous within; *hypothecium* black or fuscous-black; spores 8, colourless, ellipsoid, simple, small; paraphyses indistinct, gelatina hymenea cærulescent with iodine.

On calcareous alpine rocks, rare. 1866.

SYN:—Nyl. in Flora 1866, p. 419.

GEOG. DISTRIB:—Europe.

BOT. PROV:—7.

WALES:—Llyn Aran! Cader Idris. (1866).

17. *L. dispansa*, Nyl. black, thin, *furfuraceous*, rimulose; *apothecia* numerous, minute, scattered, sessile, black, plane, margin thin, smooth; *hypothecium* thin, nigro-fuscous; spores 8, colourless, ellipsoid, simple.

On water-washed sandstone boulders, in sub-alpine localities, rare. 1854.

SYN:—Nyl. in Flora 1866. p. 86. *L. expansa*, Nyl. in Leight. Exs. 186. Mudd Man. 208.

Exs:—Leight. 186. Mudd 176.

GEOG. DISTRIB:—Europe.

BOT. PROV:—5...10.. 19...31.

ENGLAND:—Near Battersby! and near Roseberry! Cleveland, Yorkshire. Mr. Mudd. near Bewdley, Worcestershire. Dr. Holl.

IRELAND:—Near Cork! Mr. Carroll.

CHANNEL ISLANDS:—Rozel, Jersey! Mr. Larbalestier.

18. *L. sylvicola*, (Flot.) cinereous or pale yellowish-tawny, thin, *furfuraceous*, rimulose, effuse, (K—C—); *apothecia* black, small, convex, immarginate, solitary or 2-3 connate, colourless within; *hypothecium* nigricant; paraphyses indistinct; spores 8, colorless, ellipsoid, simple; gelatina hymenea vinous red with iodine.

On maritime rocks, rare.

SYN:—Flot. Lich. Siles. No. 171. (1829.) Nyl. Lapp. or. 185. Crombie Enum. 69.

Exs:—Larbal. 84. Arn. 409. a.

GEOG. DISTRIB:—Germany.

BOT. PROV:—1...7.. 31.

ENGLAND:—Buckfastleigh, Devon. Mr. Holmes.

WALES:—Nant Gwynant! Snowdon.

CHANNEL ISLANDS:—St. Peter's Valley, Jersey! Mr. Larbalestier.

Var. *infidula*, Nyl. whitish; *apothecia* livido-nigricant, cinerascent within; *hypothecium* paler.

On maritime rocks, rare.



SYN :—Nyl. in Flora 1868. p. 475. Crombie Enum. 69.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1...7...31.

ENGLAND :—Buckfastleigh, Devon. *Dr. Holl.*

WALES :—Dolgelley ! *Dr. Holl.*

CHANNEL ISLANDS :—Rozel Manor, Jersey ! *Mr. Larbalestier.*

19. *L. sympathetica*, Tayl. *pale brown*, sub-determinate, *tartareous, thickish*, plane, *rimuloso-areolate, furfuraceous*, (*K yellow C yellow*) ; *apothecia black*, numerous, distinct, small, *sub-innate, rugose, margin indistinct, rugose* ; *hypothecium thick, black or brownish-black* ; spores 8, colourless, ellipsoid, simple.

On sandstone blocks in maritime localities, rare 1831.

SYN :—Tayl. MS. in herb. Borrer ! *L. prominula*  $\beta$ . Borr ! E. B. Suppl. 2687. Hook. Br. Fl. 2. 176.

FIG :—E. Bot. Suppl. 2687. fig. 1. (2 left hand figs).

GEOG. DISTRIB :—Europe.

BOT. PROV :—2...5...7...19.

ENGLAND :—Rye ! *Mr. Borrer.* Wenlock ! Shropshire.

IRELAND :—Dunkerron ! *Dr. Taylor in herb. Borrer.*

WALES :—Llandudno !

20. *L. crustulata*, (Ach.) *pale brownish or greyish*, very thin, tartareous, effuse, *slightly rimuloso-areolate*, furfuraceous, (*K—C—*) ; *apothecia very numerous*, scattered, sessile, plane, *black*, margin thin, entire ; *hypothecium thick, brownish-black* ; spores 8, colourless, oblong, simple.

On sandstone rocks, rare.

SYN :—*Lecidea parasema* var. *crustulata*, Ach. Syn. 18. (1817.)

*L. crustulata*, Mudd Man. 209. (1861).

EXS :—Mudd 177. Leight. 333.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1...3...10...19.

ENGLAND :—Larch Bank ! near Ayton, Cleveland. *Mr. Mudd.* Exeter. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varcane.*

IRELAND :—Killeully ! Cork. *Mr. Carroll.* O'Donoghue's Prison ! Killarney. *Dr. Taylor.*

21. *L. trochodes*, Tayl. *rust-brown*, thin, leproso-tartareous, *slightly rimose*, indeterminate ; *apothecia black, small, roundish*, uneven, *margin tumid, uneven* ; *hypothecium thick, black* ; spores 8, fuscous, elliptico-oblong, simple, large.

On calcareous mountain rocks, rare. 1836.

SYN:—Tayl. Fl. Hib. 2. 259. (1836.) Leight. Brit. Graph. p. 13. (1854).

FIG:—Leight. Br. Graph. t. 5. f. 8.

GEOG. DISTRIB:—Europe.

BOT. PROV:—19.

IRELAND:—Carig Mountain! co. Kerry. *Dr. Taylor in herb. Borrer.*

22. *L. limosa*, Ach. cinerascens, subleprose, thin, effuse; apothecia black, opaque, naked, convex, internally cinerascens; hypothecium slightly fuscous; spores 8, colourless, ellipsoid, or fusiform-ellipsoid, simple.

On the earth in mountain ranges, rare. 1870.

SYN:—Ach. Syn. 26. (1817.) Nyl. Scand. 221. Crombie En. 75.

EXS:—Fellm. 166.

GEOG. DISTRIB:—Switzerland, Norway, Sweden, Lapland.

BOT. PROV:—15.

SCOTLAND:—Ben Lawers; Ben Macdhuil. *Rev. J. M. Crombie.*

\*\*\* *Thallus powdery.*

23. *L. lucida*, Ach. citrine yellow or virescent, thin, effuse, leproso-pulverulent; apothecia minute, pale waxy yellow, plane or convex, immarginate; spores 8, colourless, oblongo-ovoid or narrowly obovate, simple, minute; gelatina hymenea cærulescent, then vinous-red with iodine.

On shady rocks, stone walls, earth and mosses, common. 1803.

SYN:—Ach. Prodr. 39. (1798.) Syn. 48. Nyl. Scand. 195.

FIG:—E. Bot. 1550. Hepp Sporen t. 56. f. 484.

EXS:—Hepp 484. Zw. 92. Schaer. 225. Larbal. 36. Anzi Langob. 123.

GEOG. DISTRIB:—Sweden, Silesia, Switzerland, Germany, Lombardy, Russia.

BOT. PROV:—2, 3, 5, 7, 9, 15, 19, 31.

ENGLAND:—Woolton, Allerton, &c. near Liverpool. *Sir. J. E. Smith.* (1803.) Cuckfield, Sussex; Tunbridge Wells. *Mr. Borrer.* Oswestry! Shropshire. *Rev. T. Salway.* Cavley Bridge road, Exeter. *Mr. Parfitt.* near Knightsford Bridge, Worcestershire; Croestien near Monmouth. *Dr. Holl.* Haughmond Hill! Nesseliffe Hill! Llanymynech Hill! Shropshire.

SCOTLAND:—Blair Athole; Falls of Tummel. *Rev. J. M. Crombie.*

IRELAND:—Castlebernard Park. *Mr. Carroll.*

WALES:—Garth near Dolgelley. *Dr. Holl.* between Bala and Dolgelley! Talylyn Pass! Cader Idris.

CHANNEL ISLANDS :—Rozel Manor ! Jersey ; Guernsey ; Sark.  
*Mr. Larbalestier.*

\*\*\*\* *Thallus granulate.*

† *Hypothecium colourless.*

24. *L. prominula*, Borr. *pale tawny brown*, determinate, somewhat tartareous, thin, *minutely granulate*, (K yellow C yellow); *apothecia black*, numerous, crowded but distinct, small, sessile, *plane, opaque, margin obtuse, entire*, slightly flexuose and polished, internally grey or pale brownish; *excipulum nigro-fuscous, lateral only*; *hypothecium colourless*; spores 8, colourless, elliptico-oblong, *simple*.

On flints, not common.

SYN :—a. Borrer ! in E. Bot. Suppl. 2687. (1831.) Hook. Br. Fl. 2. 175. Mudd Man. 203.

FIG :—E. Bot. Suppl. 2687. fig. 1. (2 right hand figs).

GEOG. DISTRIB :—Europe.

BOT. PROV :—1, 2.

ENGLAND :—Sussex Downs ! *Mr. Borrer.* Exmouth ; Haldon, Devon. *Mr. Parfitt.*

25. *L. parissima*, Nyl. *cinereo-virescent*, thin, *granulose*, effuse ; *apothecia black, innato-sessile*, numerous, minute, scattered, simple or congregate, *plano-convex, internally pale*, margin obliterated ; *hypothecium pale* or merely a thin brown line ; paraphyses distinct ; spores 8, colourless, oblong or fusiform-oblong, simple, minute ; gelatina hymenaea vinous-yellow with iodine.

On old palings, rare. 1870.

SYN :—Nyl. in litt. 1870. Cromb. in Linn. Journ. 11. 484.

GEOG. DISTRIB :—Europe.

BOT. PROV :—3.

ENGLAND :—Golder's Green, Hendon ! Middlesex. *Rev. J. M. Crombie.* (May, 1870.)

26. *L. tenera*, Nyl. *cinereo-virescent*, thin, *unequal or sub-granulato-unequal*, indeterminate, rimulose ; *apothecia pale, minute, plane, margin paler*, nearly white ; spores 8, colourless, oblong or sub-bacillar, simple (or obsoletely and spuriously, 1-septate) ; paraphyses few, rather thick, apex incrassate or clavate ; epithecium and *hypothecium colourless* ; gelatina hymenaea blue with iodine.

On wet maritime granitic rocks, rare. 1868.

SYN :—Nyl. in Flora 1869. p. 83. Crombie En. 70. Linn. Journ. 11. p. 483.

GEOG. DISTRIB :—Europe.

BOT. PROV :—15.

SCOTLAND :—S. of the Bay of Nigg, Kincardine. *Rev. J. M. Crombie*. (1868).

Spermatia oblong. Allied to, though distinct from, *L. globulosa*. Flk.

27. *L. flexuosa*, (Fries.) *albido-cinereous* or *cinereous*, *granulose* or *evanescent*, effuse, thin; *apothecia* black, plane, scattered, sessile, *margin* thin, *flexuose*, whitish within; *hypothecium* colourless; *spores* 8, colourless, ellipsoid, simple, *minute*; *gelatina hymenea* dilutely *cærulescent* then slightly *fulvo-rubescant*.

On old pines and wood, frequent.

SYN :—Fries L. E. 268. Nyl. Scand. 197. Mudd Man. 197.

FIG :—Hepp Sporen t. 56. f. 486.

EXS :—Nyl. 53. Hepp 486. Anzi Langob. 63.

GEOG. DISTRIB :—France, Switzerland, Bavaria, Lombardy, Sweden, Scandinavia, Central Lapland.

BOT. PROV :—10...15.

ENGLAND :—Lounsdale; Kildale, Cleveland. *Mr. Mudd*. Hendon, Middlesex. *Rev. J. M. Crombie*.

SCOTLAND :—Killin. *Rev. J. M. Crombie*.

forma *æruginea*, (Borr.) granules of thallus dissolved into dark verdigris-green powder, and forming a rimoso-diffract crust.

On decaying rails, common. 1831.

SYN :—Borrer in E. Bot. Suppl. 2682. (1831.) Mudd Man. 197.

FIG :—E. Bot. Suppl. 2682.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1, 2...5...10...20.

ENGLAND :—Sussex! *Mr. Borrer*. (1831.) Ayton Moor! Stogdale! Baysdale! Cleveland. *Mr. Mudd*. near Treflach Hall! Oswestry, Shropshire. *Rev. T. Salwey*. Dunsford, Devon. *Mr. Parfitt*. Bromsgrove Lickey! Warwickshire; near Shrewsbury!

IRELAND :—Glanmire! Cork. *Mr. Carroll*.

28. *L. conglomerata*, Fr. *pale-green* or *greyish-green*, *granulose*, thin, effuse; *apothecia* *minute*, very numerous, solitary or *conglomerate*, *convex*, pale brown or reddish-brown, immarginate; *spores* 8, colourless, narrow, cylindrical or oblongo-cylindrical, simple.

On trees, not common.

SYN :—Fries S. V. S. p. 112. (1846.) Mudd Man. 194.

EXS :—Leight. 151.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2 .8.

ENGLAND :—Gopsall ! Leicestershire. *Rev. A. Bloxam*. Shanklin ! Isle of Wight. *Rev. T. Salwey*.

29. *L. ochrococca*, Nyl. *lutescenti-ochraceous, granulose, effuse*, granules small, contiguous or sub-dispersed, firm ; *apothecia rufous or rufescent*, plane, margin obtuse or indistinct, whitish within ; hypothecium pale ; *spores* 8, colourless, *oblongo-fusiform, simple, small* ; paraphyses indistinct ; gelatina hymenea cærulescent with iodine.

On pine trees, rare. 1861.

SYN :—Nyl. in Ofvers. V. Ak. Förk. 1860. p. 297 ; Scand. 206. Mudd Man. 194.

GEOG. DISTRIB :—Norway.

BOT. PROV :—15.

SCOTLAND :—Glenfalloch ! *Mr. Carroll*. Inverouran. *Adm. Jones*. (1861).

30. *L. spododes*, Nyl. *greenish-yellow, thin, granulate*, somewhat evanescent (K—C—) ; *apothecia cinereous or sordid pale, small, convex, immarginate* ; hypothecium colourless ; *spores* 8, colourless, oblong, simple ; gelatina hymenea blue then vinous red with iodine.

On old pales, rare. 1869.

Closely allied to *L. denigrata*, Fr. and probably a sub-species, though externally distinct.

SYN :—Crombie in Seem. Journ. Bot. 7. p. 233. (1869.) Enum. 70. Linn. Journ. 11. p. 484.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2.

ENGLAND :—Near Lyndhurst ! in New Forest. *Rev. J. M. Crombie*. (1869).

31. *L. decolorans*, Flk. *whitish or glauco-cinerascent*, thin, *incrusting, effuse, minutely granulose and leprose or pulverulent, or more largely granuloso-verrucose and smooth* ; *apothecia very variable in colour, form and size, brick-reddish, cinereo-carneous, livido-fuscous, pallido-fuscescent, nigricant or fuscous-black, scattered or conglomerate, appressed, plane and with a flexuose entire margin, or convex and immarginate*, whitish within ; *spores* 8, colourless, oblongo-ellipsoid, simple ; paraphyses indistinct.



On the earth in hilly and sub-alpine localities, common. 1793.

The state in which the thallus has larger smooth granules or verrucæ is *L. decolorans* var. *granulosa*, Whlbb. Lapp. 477. and Ach. Syn. 38. and is found in the same places with the minutely granuloso-leprose state and both appear to pass insensibly into each other. The chemical reaction (K yellow C yellow) might lead us to connect this with *L. coarctata*, *glebulosa*, &c., and perhaps they are all forms or states of one and the same lichen.

SYN:—Flk. in Berl. Mag. 1809. p. 193. Ach. Syn. 37. Nyl. Scand. 197. *L. quadricolor*, Dicks. Br. Cr. 3. p 15.

FIG:—E. Bot. 1185.

EXS:—Schær. 213. 214. Anzi It. S. 247. M. & N. 551. Mudd 165. Leight. 59. Tuck. 45. Rabh. 730. Anzi Langob. 170.

GEOG. DISTRIB:—Bavaria, Hungary, Lombardy, Italy, Switzerland, Brazils, Sweden, Russia, Scandinavia, White Mountains, N. America.

BOT. PROV:—1, 2, 3, 4, 5...10, 11...15 ..19, 20...22, 23...30.

ENGLAND:—Lound near Yarmouth. *Mr. Turner*. Eggleston, Durham. *Rev. J. Harriman*. Cliffrigg! Baysdale! Stogdale! Guisbro' Moor! Cleveland. *Mr. Mudd*. Craigforda! near Oswestry. *Rev. T. Salwey*. Kelvedon, Essex. *Mr. Varenne*. Epping Forest; near Lyndhurst, New Forest. *Rev. J. M. Crombie*. Dartmoor. *Mr. Holmes*. Stiperstones Hill! Laurence Hill! Nesscliffe Hill! Shropshire.

SCOTLAND:—Scottish Mountains, *Mr. Dickson*. (1793.) Braemar. *Rev. J. M. Crombie*.

IRELAND:—Near Belfast. *Mr. Templeton*. Kerry. *Dr. Taylor*. near Bantry. *Miss Hutchins*. co. Wicklow. *Dr. Moore*. Doneraile Mountains co. Cork. *Mr. Carroll*. Dublin Mountains. *Adm. Jones*.

32. *L. vernalis*, Ach. whitish or albido-cinerascent, very thin, unequal or sub-grnuloso-unequal or evanescent; apothecia rufous or pallido-rufous, moderate, scattered or crowded, convex, immarginate, palish within; spores 8, colourless, oblong or ellipsoideo-oblong, simple; paraphyses indistinct.

On mosses &c. frequent.

SYN:—Ach. Meth. 68. (1803.) Syn. 36. Nyl. Scand. 200.

EXS:—Fellm. 153. Tuck. 44. M. & N. 845.

GEOG. DISTRIB:—Scandinavia, Sweden, E. Lapland, Hungary, North America, N. Zealand,

BOT. PROV:—5...15...31.

ENGLAND:—Common in Shropshire!

SCOTLAND:—Ben Lawers; Bennaboord. *Rev. J. M. Crombie*.

CHANNEL ISLANDS:—Jersey; Guernsey. *Mr. Larbalestier*.

forma *subduplex*, Nyl. similar to the type, but with a

few uniseptate spores mixed with the more numerous simple ones.

On mosses, &c. 1870.

SYN :—Nyl. Scand. 201. (1861.) Crombie En. 68.

GEOG. DISTRIB :—Scandinavia.

BOT. PROV :—15.

SCOTLAND :—Central Counties. *Rev. J. M. Crombie*. (1870).

33. *L. dubia*, Borr. *pallido-virescent*, thin, effuse, *minutely granuloso-pulverulent*, *rimulose*, (K yellow C orange red); *apothecia black*, moderate, scattered or confluent, sub-immersed or sub-sessile, plano-convex, *margin soon obliterated*, *cærulescent within*; *hypothecium nearly colourless*; spores 8, colourless, oblong, simple; *paraphyses distinct*; *gelatina hymenea intense blue with iodine*.

On old palings, not common. 1813.

SYN :—Borrer in E. Bot. 2547. (1813).

FIG :—E. Bot. 2547.

GEOG. DISTRIB :—Europe.

BOT. PROV :—3, 4, 5.

ENGLAND :—Norfolk and around London. *Mr. Borrer*. (1813.) Overton! near Ludlow, Shropshire. *Rev. T. Salwey*. Essex! *Mr. Piggott*. Poplills, Warwickshire. *Rev. W. S. Rufford*. Pembridge! Herefordshire.

34. *L. turgidula*, Fr. *whitish*, very thin, effuse, *minutely granuloso- or leproso-pulverulent*, *often evanescent*; *apothecia fusco-nigricant* or *fusco-rufescent*, *slightly cæsiopruinose*, small, plane or convex, immarginate, solitary or congregate, sub-innato-sessile; *hypothecium yellowish pale brown*; spores 8, colourless, ellipsoid or ellipsoideo-oblong, simple, small; *gelatina hymenea intense blue then violet with iodine*.

On pine trees and old wood, not common.

SYN :—Fr. *Sched. Crit.* 1. p. 10. (1824.) Nyl. Scand. 201. Mudd Man. 201.

EXS :—Fries 25. Nyl. 142. Mudd 171. Anzi Venet. 74. It. S. 273.

GEOG. DISTRIB :—Sweden, France, Italy, Arctic America, Scandinavia.

BOT. PROV :—2...5. 10...15.

ENGLAND :—Baysdale! Cleveland. *Mr. Mudd*. New Forest. *Rev. J. M. Crombie*. Shropshire!

SCOTLAND :—Killin and Lochaber. *Rev. J. M. Crombie*.

35. *L. prasina*, (Fries) *dull green* or *yellowish-green*, *minutely granuloso-pulverulent*, effuse; *apothecia minute*,

hemispherical, *livid-brown or nigricant, immarginate*; hypothecium pale yellowish brown; spores 8, colourless, oblong, simple.

On trees towards the bases, not uncommon.

SYN:—*Micarea prasina*, Fr. S. O. V. 257. (1825.) Mudd Man. [196

EXS:—Mudd 164. Zw. 9.

GEOG. DISTRIB:—Switzerland, Germany, Bavaria.

BOT. PROV:—5.. 10.

ENGLAND:—Hoggarts Wood! Ingleby, Cleveland. *Mr. Mudd*. Wapley Hill, ! Herefordshire.

36. *L. querneæ*, (Dicks.) *yellowish* or pale fusco-flavescent, *minutely granuloso-pulverulent*, effuse, thin, (K yellow C orange-red); *apothecia fuscous or fusco-rubescens*, moderate, scattered, *sub-immersed, plano-convex, immarginate, concolorous within*; spores 8, colourless, ellipsoid, simple; gelatina hymenea cærulescent with iodine.

On aged oaks, not unfrequent. 1785.

SYN:—Dicks. Br. Crypt. 19. (1785.) Ach. Syn. 36. Nyl. Scand. 196.

FIG:—E. Bot. 485. Dicks. Br. Cr. t. 2. f. 3. Mudd Man. t. 3. fig. 75.

EXS:—Hepp 494. Schaer. 582. Nyl. 134. Welw. Lusit. 53. Anzi Etr. 40. Leight. 61. Larbal. 37. Mass. 311. Bohl. 84.

GEOG. DISTRIB:—France, Portugal, Italy, Sweden.

BOT. PROV:—1...3, 4, 5.. 10, 11...19...31.

ENGLAND:—Norfolk. *Mr. Dickson*. (1785.) Easby Wood! Guisbro' Wood! Cleveland. *Mr. Mudd*. between Thirsk and Woodend! Yorkshire. *Mr. Baker*. Middleton! near Oswestry, Shropshire; Wood opposite the Lodge, Herefordshire! *Rev. T. Salwey*. Newcastle, Northumberland. Newton Cap Wood near Bishop Auckland, Durham. *Mr. Winch*. Haldon and Stoke Wood, Devon. *Mr. Parfitt*. near Worcester; near Malvern; Fairlight near Hastings; Kings Kerswell, S. Devon. *Dr. Holl*. Kelvedon; Easthorpe, Essex. *Mr. Varenne*. Pophills, Warwickshire. *Rev. W. S. Rufford*. Rosall near Exhall. *Mr. Purton*. Bedfordshire. *Rev. C. Abbot*. Cambridge-shire. *Rev. R. Relhan*. New Forest, very abundant. *Rev. J. M. Crombie*. Nesscliffe Hill! Haughmond Hill! Bayston Hill! Sutton! near Shrewsbury.

IRELAND:—Butler's town river! Castlebernard, Bandon, and in Lord Kinmare's Deer Park, Killarney. *Mr. Carroll*.

CHANNEL ISLANDS:—Rozel; St. John's; Jersey! *Mr. Larbalestier*. Guernsey. *Rev. T. Salwey*.

37. *L. viridescens*, (Schrad.) *pallido-virescent*, thin, effuse, *minutely granuloso-pulverulent* (K yellow C crimson red); *apothecia fuscous, black*, moderate, scattered or confluent, sessile or sub-immersed, *more or less convex, mar-*

gined when young, subsequently sub-immarginate, obscure or palish-brown within; hypothecium pale-brown; spores 8, colourless, ellipsoid, simple; paraphyses indistinct; gelatina hymenea cærulescent with iodine.

On old stumps and pales, not common.

SYN :—Schrad. Spicil. 88. (1794.) Ach. Syn. 36. Nyl. Scand. 206.

FIG :—Hepp Sporen t. 84. f. 731.

EXS :—Hepp 731. Anzi Langob. 176.

GEOG. DISTRIB :—Germany, Hungary, Lombardy, Sweden.

BOT. PROV :—1, 2...5.

ENGLAND :—New Forest ; and near Exeter. *Rev. J. M. Crombie.* Midland Counties. *Mr. Purton.*

38. *L. sanguinaria*, (L.) whitish or cinerascens, moderate or thickish, sub-tartareous, *granuloso-unequal* or *granuloso-concrescent* (*K* yellow); apothecia black, convex, immarginate, greyish within, medulla of thallus underneath vermillion-red; hypothecium thin, pale-yellowish; spores 1, colourless, ellipsoid, simple, very large, minutely granulose, epispore broad; paraphyses indistinct; asci and epispore blue with iodine.

On trees and rocks, frequent.

SYN :—Linn. Sp. Plant No. 4. (1753.) Ach. Syn. 19. Nyl. Scand. 246.

FIG :—E. Bot. 155. Hffm. Pl. L. t. 41. f. 1. Hepp Sporen t. 56. f. 483.

EXS :—Fellm. 204. Hepp 483. M. & N. 842. Schær. 231. Muá 184. Anzi It. S. 263. Leight. 307.

GEOG. DISTRIB :—Scandinavia, E. Lapland, Sweden, Switzerland, Pyrenees, Italy.

BOT. PROV :—2...5.. 7, 8...10, 11, 12...14, 15...19...23.

ENGLAND :—Cromford Moor near Matlock. *Sir. J. E. Smith.* Carlton Bank; Baysdale; Kildale, Ingleby Park! Yorkshire. *Mr. Mudd.* Hay Park! Herefordshire. *Rev. T. Salway.* Sussex. *Mr. Borrer.* Cumberland! *Mrs. Stanger.* Brimham Rocks near Ripon. *Mr. Brunton.* Teesdale, Durham. *Rev. J. Harriman.* Hodgehope and Cheviot, Northumberland. *Mr. Winch.* Murton Crag, Northumberland. *Dr. G. Johnston.* Black Edge near Buxton. *Dr. Holl.*

SCOTLAND :—Craig Vinean! Craig-y-Barns! Dunkeld! *Dr. Lindsay.* Balmuto, Pentland Hills. *Dr. Greville.* Killin; Crianlarich. *Dr. Holl.*

IRELAND :—Lough Bay near Dublin. *Mr. Templeton.* Turk Mountain, Killarney. *Mr. Carroll.*

WALES :—Cader Idris. *Dr. Holl.* Barmouth!

39. *L. enteroleuca*, Ach. albido-virescent, crustaceous, granulose, areolato-rimulose, sub furfuraceous, or evanes-



cent (*K* yellow *C* —); *apothecia* black, numerous, crowded, small, sessile, plane or plano-convex, margin thin, smooth, paler, eventually obliterated; *hypothecium* colourless; spores 8, colourless, broadly oblong, simple, with 2 nuclei.

On rocks and stone walls, frequent.

SYN:—Ach. L. U. 177. (1810.) Syn. 19. Nyl. Scand. 217.

FIG:—Hepp Sporen t. 3. f. 6.

EXS:—Leight. 330. Zw. 13. 14. Schær. 531. Mudd 172. Hepp 6. 129. Anzi Venet. 76. Nyl. 57.

GEOG. DISTRIB:—Switzerland, Germany, Italy, France, Pyrenees, Sweden.

BOT. PROV:—1...3 . 5...7.. 10.. 26...31.

ENGLAND:—Near Battersby! *Mr. Mudd*. Llanforda! near Oswestry; Penzance! *Rev. T. Salwey*. Devon. *Mr. Purfitt*. Kelvedon; Copford, Essex. *Mr. Varcane*. Tong Priory Walls! Leeboothwood! Haughmond Hill! Brown Clee Hill! Shropshire.

IRELAND:—Loughcooter, Galway. *Mr. Carroll*.

WALES:—Aberdovey! *Rev. A. Bloxam*. Barmouth! Holyhead! Conway!

CHANNEL ISLANDS:—Common on all the Islands. *Mr. Larbalestier*.

40. *L. minuta*. (Schær.) *greenish-whitish or cream-coloured, very thin, granulate, indeterminate or obsolete; apothecia minute, numerous, scattered, adnate, plane, pallido-testaceous, reddish or nearly black when old, and then convex and immarginate; hypothecium pale; spores* 8, colourless, elliptical or oblong, simple, minute.

On trees, not common. 1854.

SYN:—Schær. Spicil. 170. (1833.) Enum. 139. Mudd Man. 195. Nyl. Lapp. Or. 145. *Diatora sylvana*, Korb. S. L. G. 200.

FIG:—Hepp Sporen t. 4. f. 17. and t. 56. f. 487.

EXS:—Hepp 17. 487. Arn. 47. Mudd 163. Leight. 298. 326.

GEOG. DISTRIB:—Switzerland.

BOT. PROV:—2, 3, 5 . 10 ..15.

ENGLAND:—Airyholme Wood! Hoggarts Wood, Ingleby, Cleveland. *Mr. Mudd*. (1854.) New Forest; Isle of Wight. *Rev. J. M. Crombie*, near Malvern. *Dr. Holl*. Braxted, Essex. *Mr. Varcane*.

SCOTLAND:—(f. *savicola*) Kincardine. *Rev. J. M. Crombie*.

Var. *sarcopsioides*, (Mass.) dirty-white or sub-virescent, granulose, effuse; *apothecia* dark-violet, *globulose, caesio-pruinose*.

On old posts, &c. rare.

SYN:—Mass. Ric. 128. (1852.) Arn. in Flora 1863. p. 330. Crombie En. 69.



FIG :—Mass. Ric. fig. 252.

EXS :—Anzi Venet. 61. 62.

GEOG. DISTRIB :—Italy.

BOT. PROV :—2...10.

ENGLAND :—Shanklin; Lyndhurst; *Rev. J. M. Crombie*. Cleveland. *Mr. Mudd*.

41. *L. aphana*, Nyl. grey, thin, sub-verrucoso- or sub-granuloso-unequal, indeterminate; apothecia black, rather small, slightly convex, immarginate, albicant within; hypothecium colourless or sometimes slightly violaceo-fuscescent in the lower portion; epithecium violaceo-fuscescent; spores 8, colourless, ellipsoid or oblong, simple, minute; thalamium vaguely violaceo-fuscescent; gelatina hymenea cærulescent with iodine.

On maritime rocks, rare. 1865.

Externally comparable with *L. sylvicola*, but quite distinct.

SYN :—Nyl. in Flora 1867. p. 327. *Crombie* En. 84.

GEOG. DISTRIB :—Europe.

BOT. PROV :—24.

IRELAND :—Near Kilkee! co. Clare. *Mr. Carroll*. (1865).

42. *L. aphanoides*, Nyl. darkly olivaceo-cinerascent, thin, sub-verrucoso- or sub-granuloso-unequal, indeterminate or sub-evanescent; apothecia black, smallish, slightly convex, immarginate, naked, whitish within; hypothecium colourless or slightly rubricosco-rufescent in lower portion; epithecium cærulescent; spores 8, colourless, ellipsoid, simple; thalamium cærulescent; paraphyses indistinct; gelatina hymenea cærulescent, then violaceo-rubescens with iodine.

On calcareous mountain rocks, rare. 1868.

Approaching *L. aphana*, Nyl. but with a differently colored thalamium and smaller spores, &c.

SYN :—Nyl. in Flora (1868.) p. 476. *Crombie* En. 84.

GEOG. DISTRIB :—Europe.

BOT. PROV :—15.

SCOTLAND :—Craig Guie, ! Braemar. *Rev. J. M. Crombie*. (1868).

43. *L. melanochroza*, Leight. luteo-virescent, thin, effuse, minutely unequally granulose, almost furfuraceous; apothecia very minute, fuscous or nigro-fuscous, scattered, sub-innato-sessile, convex, immarginate, internally pale-violet-black as if stained with pale ink; hypothecium col-

ourless; paraphyses indistinct; spores 8, colourless, very minute, ellipsoid, simple.

On decaying larch pales, rare. 1870.

SYN:—Crombie in Seem. Journ. 11. 178. (1871.)

GEOG. DISTRIB:—Europe.

BOT. PROV:—15.

SCOTLAND:—Near Loch Tummel! Perthshire. *Rev. J. M. Crombie*. (Aug. 1870).

### †† *Hypothecium dark*.

44. *L. sanguineo-atra*, (Ach. pr. p.) cinerascens or virescenti-cinerascens, granulose, thin or sub-continuous or obsolete; apothecia sanguineous-black or fuscous-black or fusco-rufescent, moderate, convex, immarginate, fusco-nigricant within, hymenium paler or pallescent; hypothecium thick, fuscous; spores 8, colourless, ellipsoid or oblong, simple.

On mosses, trees and earth, in sub-alpine localities, not frequent.

SYN:—Ach. Meth. 50. (1803.) Nyl. Prodr. 106. Scand. 199.

EXS:—Nyl. 52. Arn. 229. Anzi Langob. 181.

GEOG. DISTRIB:—Scandinavia, Sweden, France, Pyrenees, Switzerland, Bavaria, Lombardy, Algeria, Arctic America, Great Bear Lake.

BOT. PROV:—7...10...15...19.. 30.

ENGLAND:—Broughton Bank and Hoggarts Wood, Ingleby, Cleveland. *Mr. Mudd*.

SCOTLAND:—Ben Lawers! *Rev. Churchill Babington*. Glen Falloch. *Dr. Holl*.

IRELAND:—Deer Park, Belfast. *Dr. Dickie*. near Bantry. *Miss Hutchins*.

WALES:—Cader Idris. *Dr. Holl*.

45. *L. fusca*, (Schær.) viridulo-cinerascens, disperso-granulate, thin, evanescent; apothecia fuscescens or nigricant, opaque, adnate, at first plane with a thin elevated margin, then convex and immarginate; hypothecium luteo-fuscescens; spores 8, colourless, oblong or fusiform-oblong, simple; paraphyses distinct, filiform.

On dead mosses, in mountainous regions, rare.

SYN:—Schær. Enum. 140. (1850.) Fr. Arct. 195. Nyl. Lapp. Or. 143.

GEOG. DISTRIB:—France, Switzerland, E. Lapland.

BOT. PROV:—15.

SCOTLAND:—Ben Lawers. *Adm. Jones*.

46. *L. mæstula*, Nyl. darkly cinerascens, thin, de-

*presso-subgranulate* or evanescent ; *apothecia* black, minute, crowded, plane or convex, immarginate, colourless within ; spores 8, colourless, ellipsoid, simple ; paraphyses indistinct ; *epithecium* colourless ; *hypothecium* entirely fusco-obscure ; *gelatina hymenea* slightly blue then vinous-red with iodine.

On palings &c. rare, 1868.

Approaching *L. myriocarpoides*, Nyl. ; *L. dispansa*, Nyl. ; and *L. turgidula*, Fr.

SYN :—Nyl. in Flora 1868, p. 344. Crombie En. 69.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2.

ENGLAND :—Near Lyndhurst in New Forest. *Rev. J. M. Crombie*. (1868).

47. *L. parasema*, (Ach.) whitish or cinereous or greenish-yellow, sub-determinate, often nigro-limitate, thin, smooth or granulose (*K* yellow *C* orange-reddish) ; *apothecia* black, small, plane or sub-convex, margin thin, smooth, at length obliterated ; *hypothecium* fuscescent ; spores 8, colourless, ellipsoid, simple, with one or two nuclei.

On trees, old palings, occasionally on rocks, and walls, frequent.

SYN :—Ach. L. U. 175. in part (1810.) Nyl. Scand. 216.

FIG :—E. Bot. 1450, in part.

EXS :—Leight. 327. 328. 329. Schær. 530. Mudd 169.

GEOG. DISTRIB :—Europe, Sweden, France, Switzerland.

BOT. PROV :—1...3...5...7...10.. (19—30)...31.

ENGLAND :—Ayrholme Wood ! Ayton ! Cleveland. *Mr. Mudd*. Devon. *Mr. Parfitt*. Kelvedon, Essex. *Mr. Varcene*. Midland Counties. *Mr. Purton*. Stannor Hill ! Herefordshire ; Shropshire !

SCOTLAND :—Common. *Rev. J. M. Crombie*.

IRELAND :—Common. *Mr. Carroll*.

WALES :—Barmouth ! Dolgelley !

CHANNEL ISLANDS :—Common on all the Islands, *Mr. Larbalestier*.

Var. *latypea*, Ach. whitish or sub-cinereous or almost evanescent, effuse, unequal, *granulato-areolate* (*K* yellow *C* orange-red) ; *apothecia* black, sessile.

On rocks, not common.

SYN :—Ach. Meth. Suppl. 10. (1803.) Syn. 14. Nyl. Scand. 217.

EXS :—Leight. 331.

GEOG. DISTRIB :—Norway, Sweden.

BOT. PROV :—5...15...19...30, 31.

ENGLAND :—Lyth Hill ; Shropshire.

SCOTLAND:—Ben Lawers. *Adm. Jones*. Coast of Kincardine. *Rev. J. M. Crombie*.

IRELAND:—Brandon Mountain. *Mr. Carroll*. co. Down. *Adm. Jones*.

CHANNEL ISLANDS:—La Coupe! Jersey. *Mr. Larbalestier*.

Var. *elaeochroma*, Ach. greenish-yellow or yellow or greyish-green, effuse or nigro-limitate, granulose or granuloso-furfuraceous and cracked, (K yellow C orange-reddish); apothecia black, small, numerous, plane or convex, margin thin, afterwards obliterated.

On trees, frequent.

SYN:—Ach. L. U. 275. (1810.) Syn. 18. Nyl. Scand. 217.

FIG:—E. Bot. 1450. in part.

EXS:—Leight. 126. Mudd 170. Nyl. 140. Zw. 128. Bohl. 45. Maundon 4. M. & N. 746.

GEOG. DISTRIB:—France, Switzerland, Italy, Hungary, Germany.

BOT. PROV:—1, 2, 3...5...8...10 ..15, 16. 19, 20...31.

ENGLAND:—Ayton! *Mr. Mudd*. Oswestry! *Rev. T. Salwey*. Sussex! *Mr. Borrer*. Twycross! Leicestershire. *Rev. A. Blouam*. Ulting and Hatfield! *Mr. Pagott*. Devon. *Mr. Parfitt*. Lynton; Witham! Feering; Baddow, Essex. *Mr. Varcene*. Red Hill! Albury! Shelton! Sharpstones Hill! Sutton Spa! Shropshire.

SCOTLAND:—Glen Nevis! *Dr. Lindsay*. Long Island. *Prof. Balfour*.

IRELAND:—Fermoy! *Mr. Chandler*. Castlebernard! Bandon; Blarney!; Glanmire! Cork! *Mr. Carroll*.

WALES:—Woods! common.

CHANNEL ISLANDS:—Common on all the Islands. *Mr. Larbalestier*.

Var. *flavens*, Nyl. similar to the type, but with a yellowish thallus and apothecia internally whitish, and hypothecium nearly colourless, (K yellow C orange-red).

On trees, rare. 1869.

“Latet sub *claeochroma*, Ach. (ex. hb. Ach.) a quâ etiam parum diversa.”

SYN:—Nyl. Scand. 217. (1861.) Crombie En. 77.

GEOG. DISTRIB:—Scandinavia.

BOT. PROV:—15.

SCOTLAND:—On spruce fir near Abergeldie Castle! Braemar and in Breadalbane. *Rev. J. M. Crombie*.

Var. *monticola*, (Ach.) similar to the type, but with evanescent thallus, apothecia and spores smaller.

On stones, rare. 1864.

SYN:—Ach. L. U. 670. (1810.) *L. parasema* var. *nitidula*, Nyl. Scand. 217.

GEOG. DISTRIB:—Scandinavia.

BOT. PROV:—15.

SCOTLAND :—Ben Lawers. *Messrs Carroll* (1864.) and *Holl*.

48. *L. protrusa*, Fries. pale sulphur-colour, effuse, thickish, tartareous, granulate, rugulose, areolato-rimose, (K yellow C orange-red); apothecia yellow, numerous, moderate, congregated, confluent, innato-sessile, black, plane, at length convex, margin thin, smooth, entire, eventually obliterated; hypothecium rufo-fuscous; spores 8, colourless, elliptico-oblong, simple.

On alpine rocks, frequent.

SYN :—Fries L. Ref. 324. (1831.) Mudd Man. 207. *L. scabra*, Tayl. Fl. Hib. 2. 121. *L. enterochlora*, Tayl.!

EXS :—Schær. 578. Zw. 12. Leight. 299.

GEOG. DISTRIB :—Switzerland, Germany, Italy, Tyrol Alps.

BOT. PROV :—1.. 5...7...10, 11...18, 19.

ENGLAND :—Durham! *Mr. Robertson*. Stoney Valley near Torquay! *Dr. D.akin*. Cliffrigg! Cleveland. *Mr. Mudd*. Lanorma Cave! Cornwall; *Mr. Borrer*.

SCOTLAND :—Isle of Skye! *Mr. Borrer*.

IRELAND :—Derriquin! *Dr. Taylor*. Glengariff! Cork! *Mr. Carroll*.

WALES :—Aberdovey! *Rev. A. Bloxam*. South Stacks! Holyhead Mountain.

49. *L. sublatypea*, Leight. whitish or albido-cinerascent, tartareous, sub-areolato-granulose, or unequally granulose, more or less dispersed, (K—C—); apothecia nigro-fuscous, numerous, scattered, sessile, concave, margin thickish, prominent, elevated, somewhat polished; hypothecium nigro-fuscous; epithecium dark-bluish-black; paraphyses crowded, rather indistinct; spores 8, colourless, ellipsoid, simple.

On alpine rocks, rare. 1870.

Externally somewhat resembling some state of *L. parascema* var. *latypea*, (K yellow C orange-reddish) but differing in chemical reaction and other characters.

GEOG. DISTRIB :—Europe.

BOT. PROV :—15.

SCOTLAND :—Craig Tulloch! and Glen Fender, Blair Athole. *Rev. J. M. Crombie*.

50. *L. rusticula*, Nyl. albido-glaucous, granulate, granules sub-conglomerate, depresso-convex, sub-crenate, smooth, (K yellow, C yellow); apothecia minute, somewhat concave, black, margin obtuse, entire, eventually obliterated; hypothecium fuscous; spores 8, colourless, ellipsoid, simple; paraphyses indistinct; gelatina hyme-



nea deep blue, afterwards dirty-lutescent with iodine.

On quartzose rocks; rare. 1866.

SYN :—Nyl. in Flora 1866. p. 371. Leight. Not. Lich. No. xv.

GEOG. DISTRIB :—Europe.

BOT. PROV :—7.

WALES :—Giant's Pebbles! Cader Idris.

51. *L. furvella*, Nyl. *nigro-fuscous*, effuse, *obliterato-squamulose*, *granuloso-furfuraceous*, *diffRACTO-areolate*; *apothecia* small, scattered, *appressed*, plane, black, rugulose, margin thin, smooth, *flexuose*; *epithecium nigricant*; *hypothecium nigro-fuscous*; spores 8, colourless, oblong or ovate, simple.

On micaceous-schistose alpine rocks, rare. 1861.

SYN :—Mudd Man. 207. (1861.) Crombie Enum. 84.

GEOG. DISTRIB :—Europe.

BOT. PROV :—15.

SCOTLAND :—Ben Lawers! *Adm. Jones*. near base of Ben Lawers! *Mr. Carroll*. Glen Callater; foot of Ben-y-gloe; Glen Fender; Blair Athole. *Rev. J. M. Crombie*.

52. *L. furvula*, Nyl. *nigro-fuscous*, effuse, *obliterato-squamulose*, *granuloso-furfuraceous*, *continuous*; *apothecia* scattered, *sessile*, plane, black, margin thin, *sub-flexuose*; *epithecium cærulescent*; *hypothecium black*; spores 8, colourless, oblong, simple.

On schistose alpine rocks, very rare. 1864.

SYN :—Nylander in Flora (1866.) p. 418. Crombie Enum. 84.

GEOG. DISTRIB :—Europe.

BOT. PROV :—15.

SCOTLAND :—Ben Lawers! *Messrs. Carroll* (1864.) and *Holl*.

53. *L. alpestris*, (Smmrf.) *cinerascent*, thin, *granulate* or *granulato-sub-areolate* or *sub-evanescent*, *hypothallus whitish*; *apothecia black*, *convex*, moderate, *immarginate*, concolorous within; *epithecium sordidly cærulescent*; *hypothecium fuscescent* or *fuscous*; spores 8, colourless, oblongo-ellipsoid or oblong, simple; paraphyses scarcely distinct; *gelatina hymenæa cærulescent*, then vinous-red with iodine.

On the earth in alpine places, rare. 1864.

SYN :—Sommerfelt Lapp. 156. (1826.) Nyl. Lapp. Or. 158. Crombie Enum. 79.

EXS :—Fellm. 164.

GEOG. DISTRIB :—E. Lapland, Scandinavia.

BOT. PROV :—15.

SCOTLAND :—Summit of Ben Lawers! *Mr. Carroll*. (1864.) Ben Macdhuì; Braedalbane and Braemar. *Rev. J. M. Crombie*.

54. *L. cuprea*, Smmr. *whitish, granuloso-concrete* or *granuloso-diffract* or continuous; *apothecia fusco-rufous* or fuscous-black, plane or convex, *immarginate*, fuscous within, with paler hymenium; hypothecium fuscous or fuscous; spores 8, colourless, oblong, simple; gelatina hymenea slightly cærulescent, then vinous-red with iodine.

On the earth in alpine regions, rare.

SYN :—Smmr. Lapp. 165. (1826.) Nyl. Scand. 199. Crombie En. 68.

EXS :—Fries 349. Anzi Langob. 179. Fellm. 152.

GEOG. DISTRIB :—Sweden, E. Lapland, Spitzbergen, Greenland, Lombardy.

BOT. PROV :—15.

SCOTLAND :—Summit of Ben Lawers and above Loch-na-Cat. *Rev. J. M. Crombie*.

Var. *cupreiformis*, E. Nyl. thin, *egranulose*; *apothecia rufo-fuscous*.

On the earth in alpine regions, rare. 1868.

SYN :—*L. vernalis* var. *cupreiformis*, E. Nyl. Al. Lafv. p. 90. Nyl. Lapp. Or. 144. Crombie En. 68.

GEOG. DISTRIB :—E. Lapland.

BOT. PROV :—15.

SCOTLAND :—Loch-na-Cat. *Adm. Jones*. (1868).

Var. *Berengeriana*, (Mass.) *granuloso-concrete, contiguous*; *apothecia fusco-nigricant*; spores oblong or ellipsoideo-oblong; gelatina hymenea vinous-red with iodine.

On the earth in alpine regions, rare.

SYN :—*Biatara*, Mass, Ric. 128. (1852.) Nyl. Lapp. Or. 144. Crombie Enum. 68.

FIG :—Mass. Ric. fig. 254.

EXS :—Fellm. 162.

GEOG. DISTRIB :—E. Lapland, Bavaria, Italy.

BOT. PROV :—15.

SCOTLAND :—Ben Lawers. *Mr. Carroll*.

55. *L. arctica*, Smr. *albido-cinerascent*, effuse, *granulose* or *granuloso-verrucose*, granules small, papilloso-sub-globose; *apothecia* small, *black, slightly caesio-pruinose, convex, immarginate*, within obscurely cinerascent; hypothecium fuscous; spores 8, colourless, ellipsoid or oblong, simple; paraphyses indistinct; gelatina

hymeneæ slightly cærulescent with iodine.

On alpine mosses, rare. 1860.

SYN :—Smurf. Lapp. 156. (1826.) Nyl. Scand. 220. Mudd 200.

EXS :—Zw. 11. Th. M. Fries 20. Fellm. 163. Rabh. 734.

GEOG. DISTRIB :—Greenland, Finnmark, E. Lapland, Finland, Russia, Italy.

BOT. PROV :—15.

SCOTLAND :—Ben Lawers! *Messrs Jones & Carroll*. (1860). Braedalbane and Braemar; summits of Lochnagar and Ben Macdhui. *Rev. J. M. Crombie*.

56. *L. uliginosa*, (Schrad.) *fuscous* or *fusco-nigricant*, minutely granulose, sub-leprose, effuse; apothecia fuscous-black or black, plane or sub-convex, scattered or confluent, darkish within, margin entire evanescent; hypothecium fuscous; spores 8, colourless, ellipsoid, simple; paraphyses indistinct; gelatina hymeneæ reddish-brown with iodine.

On moist or turfy earth, common. 1799.

SYN :—Schrad. Spicil. 88. (1794.) Ach. Syn. 25. Nyl. Scand. 198.

FIG :—E. Bot. 1466. Hepp Sporen. t. 16. f. 132.

EXS :—Hepp 132. Mudd 167. M. & N. 747. Schaer 162. 163. Fellm. 150. Anzi It. S. 249. Leight. 120.

GEOG. DISTRIB :—Sweden, E. Lapland, Germany, Switzerland, Hungary, Italy.

BOT. PROV :—1, 2, 3, 4, 5...10, 11.. 15, 16...(19—30) ..31.

ENGLAND :—Near Yarmouth. *Mr. Turner*. (1799.) Surrey. *Mr. Borrer*. Kildale Moor! Baysdale Moor! Yorkshire. *Mr. Mudd*. Prestwick Carr; Cheviot, Northumberland; Redheugh and Eglestone, Durham. *Mr. Winch*. near Exeter. *Mr. Parfitt*. Warley Common; Mile-end near Colchester, Essex. *Mr. Varenne*. New Forest; Epping Forest; Hampstead Heath; *Rev. J. M. Crombie*. Mynydd-y-Mylr! Caer Caradoc! Pontesford Hill! Wrekin Hill! Laurence Hill! Shropshire.

SCOTLAND :—Ben Lawers! *Sir. W. J. Hooker*. Hill of Ardo; Trosachs; Appin. *Rev. J. M. Crombie*.

IRELAND :—Not uncommon. *Mr. Carroll*.

CHANNEL ISLANDS :—Jersey; Guernsey. *Mr. Larbalestier*.

forma *fuliginea*, (Ach. Syn. 35.) only differs in the habitat on old stumps and wood and is rarer.

EXS :—M. & N. 1149. Anzi Langob. 175.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2, 3. 8 ..10.

ENGLAND :—Sussex. *Adm Jones*. Bilsdale; Kildale and near Ayton, Yorkshire. *Mr. Mudd*. Gopsall! Leicestershire. *Rev. A. Bloxam*. Kelvedon; Bocking, Essex. *Mr. Varenne*. Wrekin! Shropshire.

Var. *humosa*, (Ehrh.) *cervino-lutescent*, *sub-squamuloso-granulate*, granules convex, coarse, more or less dispersed.

On earth and peat walls, rare. 1869.

SYN :—Ehrh. Crypt. 135. (1785.) Crombie En. 67.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2 ..5...7...15.

ENGLAND :—New Forest, Hants. *Rev. J. M. Crombie*. Stiperstones Hill! Shropshire.

SCOTLAND :—Kincardine! Hill of Ardo near Aberdeen. *Rev. J. M. Crombie*.

WALES :—Dolgelley. *Dr. Holl*. (1869).

57. *L. Mooreana*, Carr. *greyish-white* or *cream-coloured*, thin, tartareous, *granuloso-verruculose*, *rugulose*, effuse (K yellow then reddish); *apothecia black*, large, solitary or congregated, sessile, plane, somewhat scabrous, margin thin, entire, flexuose; *hypothecium thin*, dark-brown; spores 8, colourless, elliptico-oblong or ovate, simple.

On sub-alpine trap rocks, rare. 1859.

SYN :—Carroll Lich. Hib. 7. (1859,) Mudd Man. 207.

GEOG. DISTRIB :—Europe.

BOT. PROV :—30.

IRELAND :—Crowglen! near Belfast. *Dr. Moore*.

\*\*\*\* *Thallus areolate*, *areolæ convex* or *granular*.

† *Hypothecium pale* or *colourless*.

58. *L. aglæa*, Smmr. *flavescent* or *ochroleucous* and *vi-rescenti-cinereous*, crustaceous, thickish, *areolato-diffract*, rimose, *areolæ tumid*, convex, generally minutely diffractoinsculpt or unequally rugose or smoothish (K yellow C yellow); *hypothallus black*; *apothecia black*, adnate to the *areolæ*, moderately large, plano-convex, somewhat shining, immarginate, darkly cinerascens within; *hypothecium pale*, slightly rufescent; spores 8, colourless, ellipsoid, simple; *thalamium cæruleo-cinerascent*, *epithecium cæruleo-nigricant*; *paraphyses indistinct*; *gelatina hymenæa cærulescent* with iodine.

On alpine rocks, rare. 1808.

SYN :—Smmr. Suppl. Fl. Lapp. 144. (1826.) Nyl. Scand. 228. *L. Crombiei*, Jones! Nyl. in Flora 1868. p. 345. Crombie Enum. 82. *L. viridiatra*, Borr! Br. Fl. 2. 177.

FIG :—E. Bot. 1831.

EXS :—Zw. 23. Anzi Langob. 150.

GEOG. DISTRIB :—Norway, Switzerland, Hungary, Italy.

BOT. PROV :—7...11...15...19.

ENGLAND :—Near Winch Bridge ; near Whey-Syke, Teesdale Forest, Durham. *Rev. J. Harriman*. (1808).

SCOTLAND :—Ben Lawers ! *Dr. Holl*. Glen Callater ; Ben Cruachan ! Khoil, Braemar. *Rev. J. M. Crombie*.

IRELAND :—Mangerton. *Mr. Carroll*.

WALES :—Mynyddy-y-Gader !! near Dolgelley. *Dr. Holl*. Cader Idris north escarpment !

59. *L. areolata*, Schær. *pallido-flavescent*, crustaceous, thickish, areolate or areolato-diffract, rimose, areolæ plano-convex, smooth (K yellow C yellow) ; hypothallus black ; apothecia black, adnate to the areolæ, naked, opaque, moderate, plano-convex, immarginate, cinerascens within ; hypothecium colourless, very slightly rufescent ; spores 8, colourless, ellipsoid, simple ; paraphyses crowded but distinct.

On schistose rocks in mountain ranges, rare. 1864.

SYN :—Schær. *Spicil.* 127. (1828.) *Enum.* 114. *Crombie En.* 82.

GEOG. DISTRIB :—Switzerland.

BOT. PROV :—15.

SCOTLAND :—Summit of Ben Lawers ! *Adm. Jones & Carroll*. (1864).

The above description was drawn up from examination of the original specimen in Mr. Carroll's Herbarium, which was externally similar to *L. aglæa* and *L. Crombiei* and internally differed in no respect. I cannot but regard it as a state or variety of *L. aglæa*. Can our Scotch lichen be identical with Schærer's, which is described as having the areolæ of the thallus "candidæ" and the apothecia "intus alba" ?

60. *L. tessellata*, (Flk.) *creamy* or *whitish*, tartareous, sub-determinate, areolato-rimoso-diffract, areolæ angular, plano-convex, smooth, opaque (K yellow then red) ; apothecia scattered or confluent, sessile, adnate, black, slightly pruinose, plane or sub-convex, internally white, margin thin, acute, elevated, flexuose ; hypothecium colourless, the margin only with a thin black line ; epithecium nigricant ; thalamium pale yellowish ; spores 8, colourless, ellipsoid, simple, moderate, granular.

On alpine rocks, not common. 1870.

SYN :—Flk. *D. Lich.* 64. (1821.) *Smmrf. Lapp.* 144. *Nyl. Scand.* 227. *Crombie Enum.* 82, *L. spilota*, Fr. *L. E. E.* 297. pr. p.

GEOG. DISTRIB :—Scandinavia, Lapland, Sweden, France, Germany, Hungary, Italy, Switzerland.

BOT. PROV :—5...15...23.



ENGLAND :—Caer Caradoc ! Shropshire.

SCOTLAND :—Ben Lawers. *Messrs Jones & Carroll*.

IRELAND :—Lough Bray near Dublin. *Messrs Jones & Carroll*.

61. *L. spilota*, Fr. similar externally and internally to *L. tessellata*, Flk. but with a different chemical reaction K—C—.

On alpine rocks, not common.

I have never seen British specimens of the typical form, but the ferruginous state, forma *ochracea*, (Ach. L. U. 166) frequently occurs.

SYN :—Fries L. Eur. p. 297. (1831.) in part (specimen from Dr. Th. M. Fries.)

EXS :—Arn. 260. Hepp 723. Anzi Langob. 124. 125. 126.

GEOG. DISTRIB :—Germany, Switzerland, Italy, Hungary, Sweden.

forma *ochracea*, (Ach.) *thallus ferruginous* ; *apothecia white within*.

On alpine rocks, not common. 1856.

SYN :—Ach. L. U. 166. (1810). Crombie Enum. 82.

EXS :—Spruce Lich. Pyren.

GEOG. DISTRIB :—France, Pyrenees.

BOT. PROV :—1...5...7...15.

ENGLAND :—Bathaston ! *Mr. Broome*. Mynydd-y-Myfyr ! near Oswestry, Shropshire.

WALES :—Between Bala and Dolgelley ! (1856.) Pen-y-gwryd ! Snowdon.

62. *L. mollis*, (Whlhb.) *cinereous* or *pallido-fusco-cinerascent*, *rimuloso-areolato-diffract*, *areolae minutely albo-verrucose*, *convex*, *nigro-limitate* ; *apothecia fuscous-black* or *black*, *superficial*, *plane*, *marginated*, *whitish within* ; *hypothecium colourless* ; spores 8, colourless, ellipsoid, simple ; paraphyses distinct.

On mountain rocks, not unfrequent.

SYN :—Whlhb. Lapp. 172. (1812.) Nyl. Scand. 223.

EXS :—Fellm. 180. Mudd 168. Arn. 262. Leight. 362.

GEOG. DISTRIB :—E. Lapland, Norway, Germany.

BOT. PROV :—5...7...10...15.

ENGLAND :—Kildale Moor ! Battersby ! Cleveland. *Mr. Mudd*. Nesscliffe Hill ! Shropshire.

SCOTLAND :—Braemar ; Breadalbane. *Rev. J. M. Crombie*.

WALES :—Barmouth !

63. *L. mesotropa*, Nyl. *cinerascent*, *verrucoso-areolato-diffract*, *areolae plano-convex*, *subsquamose* around the *apothecia*, indeterminate (K—C reddish) ; *apothecia fuscous-black* or *nigricant*, *opaque*, somewhat plane, adnate

to the areolæ, margin obtuse or evanescent, whitish within; *hypothecium* colourless; *epithecium* fuscous; spores 8, colourless, ellipsoid, simple; paraphyses slender, indistinct.

On mountain schistose rocks, rare. 1867.

SYN:—Nyl. in Flora 1867. p. 328. Crombie En. 81.

GEOG. DISTRIB:—Europe.

BOT. PROV:—15.

SCOTLAND:—Ben Lomond! Rev. J. M. Crombie. (1867).

64. *L. inserena*, Nyl. darkly cinereous, rimoso-areolate or areolato-granulose, areolæ often scattered, *hypothallus* black, very conspicuous; apothecia black, plane; *hypothecium* with an opaque white stratum in the lower portion; *epithecium* cærulescenti-fuscous; spores 8, colourless, ellipsoideo-oblong, simple; *paraphyses* indistinct; *gelatina hymenea* cærulescent, then violet especially the *thecæ*, with iodine.

On quartzose mountain rocks, rare. 1869.

Resembling *L. tenebrosa* \* *tumidior*, Nyl.

SYN:—Nyl. in Flora 1869. p. 84. Crombie En. 85.

GEOG. DISTRIB:—Europe.

BOT. PROV:—15.

SCOTLAND:—Craig Guie, Braemar. Rev. J. M. Crombie. (1869).

65. *L. coarctata*, (Sm.) whitish or cinerascens, thin, rimulose or areolato-granular or sub-continuous or leprose, (K faint yellow or—C red); apothecia fuscous, fusco-rufescent or blackish, small, scattered, innate or sessile, often with a white pulverulent, coarctate, spurious thalline margin; *hypothecium* colourless; spores 8, colourless, ellipsoid, simple, large.

A very variable lichen, the principal forms of which are detailed below, to which may also possibly be added *L. Salorii*, E. Bot. Suppl. 2861. and *L. Taylori*, Salw. (*L. variegata* Nyl.) as the chemical reaction is the same in all. Acharius's description of his var. *listrata* accords generally with *L. Taylori*, Salw.

forma *elacista*, (Ach.) greyish-white, very thin, effuse, leprose; apothecia innate or sessile, concave or plane, with a conspicuous white coarctate margin.

On walls and stones, frequent. 1798.

SYN:—Ach. Meth. t. 9. (1803.) Syn. 149. Nyl. Prodr. 112.

FIG:—E. Bot. t. 534. (1798.) Ach. Meth. t. 4. f. 4. Hepp Sporen t. 21. f. 186.

EXS:—Nyl. L. P. 54. Schaer. 312. Hepp 186. Mass. 323. Mudd 124. Anzi It. S. 206. Leight. 177.

GEOG. DISTRIB:—France, Switzerland, Hungary, Italy, Sweden.

BOT. PROV:—1, 2, 3, 4, 5...7...10, 11...15...30, 31.

ENGLAND:—Yarmouth. *Mr. Turner.* (1798.) Yorkshire! *Mr. Dizon.* Oswestry! Shropshire. *Rev. T. Salway.* Newton Wood! near Ayton! Cleveland. *Mr. Mudd.* Gateshead Fell; Eglestone and Gainford, Durham; Heaton Dene and near Gosforth, Northumberland. *Mr. Winch.* Valley of Rocks, Linton, Devon. *Mr. Parfitt.* Braxted, Essex. *Mr. Varenne.* Plymouth. *Mr. Holmes.* Wickeliff rocks! Ludlow; Hopton! near Nesscliffe; Nurdy Bank! Abdon! Long Mynd! near Church Stretton, Shropshire.

SCOTLAND:—Killin! *Mr. Piggot.* Birnam Hill! Dunkeld. *Dr. Lindsay.* Blair Athole. *Rev. J. M. Crombie.*

IRELAND:—Near Belfast. *Mr. Templeton.*

WALES:—Moel-y-Golfa! Montgomeryshire. Pentregaer! near Oswestry; Cader Idris!

CHANNEL ISLANDS:—Jersey; Guernsey. *Mr. Larbalestier.*

forma *involuta*, (Tayl.) *greyish-white*, tartareous, *verrucose* or *areolato-granulose*, *verrucae* often *scattered*, *convex* or *flattish*; *apothecia fusco-rufescent*, *concave* or more or less *convex*, sessile, white, *margin obliterated*.

On siliceous rocks, not unfrequent. 1836.

SYN:—*Lecanora*, Tayl.! in Mack. Fl. Hib. 2. 134. (1836.) Nyl. Scand. 196.

FIG:—Leight. Ang. Lich. t. 13. f. 4.

GEOG. DISTRIB:—Germany, Hanover, Italy.

BOT. PROV:—5...7...10...19.

ENGLAND:—Newton Wood! Cleveland. *Mr. Mudd.* Haughmond Hill! Caer Caradoc! Sharpstones! near Shrewsbury, Shropshire.

IRELAND:—Carig! and Dunkerron Mountains. *Dr. Taylor.* (1836.)

WALES:—Cwm Glas! Snowdon.

forma *glebulosa*, (Sm.) *whitish*, tartareous, *verrucoso-glebulose* or *sub-squamulose*, *verrucae tumid*, scattered or crowded; *apothecia* minute, *rufo-fuscescent*, plane, margin thin, evanescent.

On shady rocks, not unfrequent. 1808.

SYN:—Sm. E. Bot. 1955. (1808).

FIG:—E. Bot. 1955.

EXS:—Leight. 149.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1...5... 8...10.

ENGLAND:—Great Ayton! Carlton Bank, Yorkshire. *Mr. Mudd.* near Exeter. *Mr. Parfitt.* Penzance. *Mr. Curnow.* Church Stretton! Stableford! near Bridgnorth, Shropshire.

forma *ornata*, (Smmrf.) *greyish-white*, *verruculose* or *areolato-squamulose*, *squamules flat* or more or less irregularly *convex*, *margins more or less crenate*.

On alpine rocks, rare.

SYN :—Smmrf. Lapp. 92. (1826).

EXS :—Mudd 123.

GEOG. DISTRIB :—Norway, Pyrenees.

BOT. PROV :—3...5...7...10...15.

ENGLAND :—Guisbro' Moor! Cleveland. *Mr. Mudd*. Malvern Hills. *Dr. Holl*. Bergholt; Copford, Essex. *Mr. Varcane*.

SCOTLAND :—Kinnoull Hill! Perth. *Dr. Lindsay*. Ben Lawers. *Dr. Holl*. Glen Nevis; Loch Callater. *Rev. J. M. Crombie*.

WALES :—Cader Idris!

### †† *Hypothecium dark*.

66. *L. panæola*, Ach. *albido-cinereous* or creamy or pale tawny, *areolato-granulose*, *areolæ large*, *tumid*, *rimoso-diffract*, flattish or sub-convex, smooth, more or less polished, (K faint yellow C red) *with tuberculose reddish cephalodia* intermixed, *hypothallus dark brown*; *apothecia* black or nigro-fuscous, *appressed* or *immersed*, plane or sub-concave, more or less pruinose, margin thin, prominent, smooth; *hypothecium thick*, *dark brown*; spores 8, colourless, ellipsoid, simple, *very large*; paraphyses slender; gelatina hymenea intense blue with iodine.

On granitic rocks in alpine localities, not uncommon. 1807.

SYN :—Ach. L. U. 201. (1810.) Syn. 33. Nyl. Scand. 225. *Aspicilia athroocarpa*, Mudd Man. 164. *L. cechumena*, Tayl. Fl. Hib. 2. 117.

FIG :—E. Bot. 1829.

EXS :—Schær. 469. Fellm. 182.

GEOG. DISTRIB :—E. Lapland, Sweden, Switzerland.

BOT. PROV :—5...7...11...15.. 19...25.. 30.

ENGLAND :—Croukley and Eggleston, Durham. *Rev. J. Harri-man*. (1807.) Teesdale! *Mr. Robertson*. Abdon Burf! Shropshire.

SCOTLAND :—Ben Lawers! *Mr. Carroll*. Ben Cruachan; Craig Guie; Khoil. *Rev. J. M. Crombie*.

IRELAND :—Carig Mountain! *Dr. Taylor*, Tollymore Park. *Dr. Maingay*. Connor Cliff; summit of Brandon co. Kerry; Galtimore, Tipperary. *Mr. Carroll*. near Belfast. *Dr. Moore*. co. Antrim. *Adm. Jones*.

WALES :—Rocks above Corwen! *Rev. T. Salwey*. Cwm Glas! Snowdon; Llyn Aran! Llyn Cae! Cader Idris!

67. *L. tenebrosa*, (Flot.) *cinereo-nigricant* or *darkly cinereous*, tartareous, *rimoso-areolato-granulose*, often smooth, opaque, *areolæ* more or less *tumid*, (K yellow C yellow) ; *hypothallus* black ; *apothecia* small, *sub innate* in the areolæ, *black*, plane, *internally nigricant*, margin thickish, eventually obliterated ; *hypothecium nigro-fuscous* ; spores 8, colourless, ellipsoid, simple ; paraphyses distinct ; *gelatina hymenea* blue with iodine.

On alpine rocks, not common.

SYN:—Flotow in Herb. Nyl. Prodr. 127. Seand. 231. *L. fusco-cinerea*, Nyl. ! in Bot. Notis. 1852. p. 177.

FIG:—Nyl. Obs. Lich. Holm. fig. 9.

EXS:—Zw. 134. Arn. 114. 227. Anzi Langob. 154. Rabh. 746. Anzi It. S. 212. Fries 406. C.

GEOG. DISTRIB:—Sweden, Pyrenees, Bavaria, Germany, Lombardy, Italy.

BOT. PROV:—5...7 ..15 ..22...23...31.

ENGLAND:—Malvern Hills. *Dr. Holl.*

SCOTLAND:—Braemar; near Portlethen; Kincardine. *Rev. J. M. Crombie.*

IRELAND:—Killarney and Lough Bray, Dublin; Luggelaw, Wicklow. *Adm. Jones.*

WALES:—Barmouth; Dolgelley.

CHANNEL ISLANDS:—Noirmont, Jersey. *Mr. Larbalestier.*

68. *L. Bruyneriana*, (Schær.) *pale yellow*, *verrucoso-glebulose*, verrucæ *tumid*, scattered or concrete, often evanescent (K yellow, C apothecia red but thallus yellow) ; *apothecia* large, *sessile*, *concave*, *fuscous* or *black*, margin thick, incurved, entire or flexuose ; *hypothecium* black ; spores 8, colourless, ellipsoid, large, simple, granular ; paraphyses distinct ; *gelatina hymenea* yellow with iodine.

On alpine rocks, rare. 1866.

SYN:—Schær. Enum. 77. (1850).

FIG:—Hepp Sporen t. f. 615.

EXS:—Schær. 539. Hepp 615.

GEOG. DISTRIB:—Switzerland.

BOT. PROV:—7...11.

ENGLAND:—Force Garth, Teesdale. *Dr. Holl.*

WALES:—Craig-y-llam near Dolgelley. *Dr. Holl.* (1866).

69. *L. Kochiana*, Hepp. *mouse-colour* or *pale cinereous*, *fuscous*, *rimoso-areolato-diffract*, *areolæ* *plano-concave*, *nigro-limitate* ; *apothecia* black, *innate*, *immarginate*



flexuoso- or anguloso-deformed, *disk plane, somewhat shining and smooth, internally dusky; hypothecium a thin nigro-fuscous line resting on the hypothallus; spores 8, colourless, oblong, simple; paraphyses distinct.*

On alpine rocks, not unfrequent.

SYN:—Hepp Wurtz. 61. (1824.) Nyl. Scand. 322.

EXS:—Schar. 181. M. & N. 549. Hepp 729. Zw. 6, Anzi It. S. 251.

GEOG. DISTRIB:—Switzerland, Pyrenees, Spain, Germany, Norway.

BOT. PROV:—7...15...31.

SCOTLAND:—Kincardine! Braemar. *Rev. J. M. Crombie.*

WALES:—Barmouth! Snowdon! Cader Idris!

CHANNEL ISLANDS:—Rozel, Jersey. *Mr. Lurbalestier.*

Var. *lygea*, Ach. *umber-coloured, effuse, continuous, smooth, slightly rimulose; apothecia minute, adpresso-sessile, plano-convex, smooth, immarginate, nigro-fuscous, internally dusky.*

On rocks, rare. 1865.

SYN:—Ach. Syn. 34. excl. var. (1817.) Nyl. Scand. 223.

EXS:—Rabh. 768. Anzi Langob. 121. Schar. 626.

GEOG. DISTRIB:—Switzerland, Pyrenees, Lombardy, Italy.

BOT. PROV:—7.. 31.

WALES:—Cwm Glas! Snowdon. (1865.) Nant Gwynant! Snowdon.

CHANNEL ISLANDS:—Boulay Bay! Jersey. *Mr. Lurbalestier.*

70. *L. segregans*, Nyl. *whitish or albido-cinerascent, verrucoso-granulose, granules various, somewhat convex, more or less segregate or verrucoso-confluent, laxly adnate; hypothallus nigricant, scarcely visible; apothecia black, somewhat plane, immarginate, at length convex, and often aggregato-confluent, small, concolorous within; hypothecium fuscous; epithecium scarcely obscure; spores 8, colourless, oblong, simple; hymenium dusky; paraphyses moderate, scarcely distinct; gelatina hymenaeae dilutely caerulescent then vinoso-fulvescent with iodine.*

On alpine micaceo-schistose rocks, rare. 1866.

Systematically probably near *L. melancheima*, Tuck.

SYN:—Nyl. in Flora 1866, p. 372. Crombie En. 92.

GEOG. DISTRIB:—Europe.

BOT. PROV:—15.

SCOTLAND:—Ben Lawers. *Adm. Jones.*

71. *L. commaculans*, Nyl. *fuscous-black or nigricant,*

thin, opaque, sub-areolate, areolæ depressed, generally dispersed, indeterminate; *apothecia* black, somewhat convex, with scarcely any margin, *concolorous within*; *hypothecium* thickish, *rubricoso-fuscous*, this colour passing upwards into the thalamium; *epithecium* nigricant; spores 8, colourless, oblong, simple; paraphyses indistinct; *gelatina hymenea* cærulescent with iodine.

On calcareous mountain rocks, rare. 1868.

“Approaching *L. Kajanita*, in which the spores are different and the thalamium not tinged with red, but more allied to *L. dispansa*, Nyl. *Spermatia* cylindrical straight.”

SYN:—Nyl. in Flora 1868. p. 476. Crombie En. 93.

GEOG. DISTRIBUTION:—Europe.

BOT. PROV:—15.

SCOTLAND:—Morrone, ! Braemar. Rev. J. M. Crombie.

72. *L. amphotera*, Leight. white, tartareous, areolato-diffract, areolæ of compound clustered convex granules (K yellow C yellow); *apothecia* fuscous, clustered or conglomerate, innate, prominent, large, immarginate; *hypothecium* fuscous, thickish; paraphyses crowded, but distinct; spores 8, colourless, linear-oblong, simple.

On alpine rocks, rare. 1870.

The thallus of this has the general appearance of that of *Pilophoron fibula* with its fuscous cephalodia, and the spores resemble those of *Lecidea lapicida*, from which the nature of the thallus and the different hypothecium distinguish it.

SCOTLAND:—Hill of Ardo near Aberdeen. Rev. J. M. Crombie. (1870.)

\*\*\*\*\* *Thallus areolate, areolæ flat or plane.*

† *Hypothecium pale.*

73. *L. polycarpa*, Flk. cinerascens, very thin, tartareous, minutely rimuloso-areolate, areolæ plane or plano-convex, smooth, somewhat evanescent (K yellow then red); hypothallus black; *apothecia* numerous, scattered or aggregate, adnate, plane, opaque, black, soft, velvety, margin very thick, subtumid, prominent, flexuose; *hypothecium* pale or more or less rufescent, with short lateral black excipulum; *epithecium* nigricant; thalamium pale; spores 8, colourless, elliptical, simple, binucleolate.

On alpine rocks, frequent.

SYN:—Flk. in Smurf. Suppl. Lapp. 149. (1826.) Nyl. Scand. 226.

EXS:—Fellm. 189.

GEOG. DISTRIB :—E. Lapland, Scandinavia, Hungary, Sweden, France.

BOT. PROV :—7...15.. 19.

SCOTLAND :—Morrone; Ben-na-boord; Ben Cruachan; Ben Lawers; Ben Nevis; Braemar. *Rev. J. M. Crombie.*

IRELAND :—Mangerton. *Mr. Carroll.*

WALES :—Cader Idris, north escarpment! Llyn Cae! Cader Idris; Craig Breidden!

Var. *declinans*, Nyl. *hypothecium fuscous* or *fusco-rufescent* (K yellow then red).

SYN :—Nyl. Scand. 226. (1861.) Crombie Enum. 81. Leight. in Ann. and Mag. Nat. Hist. June, 1867.

EXS :—Fellm. 187. 188.

GEOG. DISTRIB :—E. Lapland, Scandinavia.

BOT. PROV :—7...15...23.

SCOTLAND :—Castleton, Braemar. *Adm. Jones.*

IRELAND :—Killiney Hill. *Dr. Moore.*

WALES :—Cader Idris, north escarpment! Llyn Cae! Cader Idris.

74. *L. marginata*, Schær. *pale apricot-colour*, tartareous, macular, diffuse, *rimuloso-areolato-diffract*, areolæ plane, unequal (K yellow); apothecia black, sessile, plane or tumid, margin thick, prominent, sometimes flexuose, at length obliterated; *hypothecium pale*; spores 8, colourless, oblong, simple.

On alpine rocks, rare. 1868.

SYN :—Schær. Enum. 115. (1850.) Crombie Enum. 83.

EXS :—Schær. 189.

GEOG. DISTRIB :—Switzerland.

BOT. PROV :—15.

SCOTLAND :—Ben Lawers. *Adm. Jones.* (1868).

75. *L. lapicida*, Fr. *cinerascent*, tartareous, thin, *areolato-rimoso-diffract*, areolæ flat or plane (K—C—); hypothallus black; apothecia numerous, small, scattered or aggregate, plane, opaque, raven-black, soft, velvety, margin thin, obtuse, slightly prominent, flexuose; *hypothecium pale*, with a thin blackish wavy line subtending the sides and base; epithecium nigricant; thalamium pale and yellowish; spores 8, colourless, narrowly oblong, simple, often with 2 nuclei; paraphyses distinct.

On alpine rocks, frequent.

SYN :—Fries L. E. 306. (1831.) Nyl. Scand. 225. Nyl. Obs. Holm. 2. (1853).

EXS :—Zw. 130.

GEOG. DISTRIB :—Scandinavia, Germany.

BOT. PROV :—5...7...15...28, 29...30.

ENGLAND :—Mynydd-y-Myfyr near Oswestry!; Bodbury Ring near Church Stretton!; Abdon Burf!; all in Shropshire.

SCOTLAND :—Breadalbane; Blair Athole; Braemar. *Rev. J. M. Crombie.*

IRELAND :—North. *Dr. Moore.*

WALES :—Nant Gwynant! Crib Goch! Snowdon.

Var. *silacea*, Ach. ferruginous-red.

On alpine rocks, not common.

SYN :—Ach. Meth. 48. (1803.) Syn. 22. Nyl. Scand. 236.

GEOG. DISTRIB :—Europe.

BOT. PROV :—7..15.

SCOTLAND :—Blair Athole. *Rev. J. M. Crombie.*

IRELAND :—Cloghan Mountains co. Antrim. *Dr. Moore.*

WALES :—Crib Goch! Nant Gwynant! Snowdon.

Var. *lithophiloides*, Nyl. evanescent; apothecia white within; spores oblong; epithecium nigricant.

On alpine rocks, rare.

SCOTLAND :—Coast of Kincardine and Ben-na-boord. *Rev. J. M. Crombie.*

76. *L. lithophila*, Ach. cinerascens, tartareous, thin, rimuloso-areolate, areolæ plane (K—C—); hypothallus black; apothecia numerous, small, scattered or aggregate, plane, opaque, black or nigro-rufescent, soft, velvety, margin thin, prominent, flexuose; hypothecium pale, slightly obscure; epithecium rufescent; thalamium pale; spores 8, colourless, oblongo-ellipsoid, simple; paraphyses distinct.

On alpine rocks, frequent.

SYN :—Ach. Syn. 14. (1817.) Nyl. Scand. 226.

EXS :—Fellm. 190.

GEOG. DISTRIB :—E. Lapland, Scandinavia, Madeira.

BOT. PROV :—1..7...12...15.

ENGLAND :—Stavelay near Kendal. *Mr. Martindale.* Cornwall. *Dr. Holl.*

SCOTLAND :—Ben Lawers; Morrone; Glen Fender; Blair Athole. *Rev. J. M. Crombie.*

WALES :—Cader Idris, north escarpment! Nant Gwynant! Snowdon.

77. *L. rimulosa*, Ach. mouse-coloured or pallido-fusco-cinerascens, rimuloso-areolato-diffract, areolæ plane, nigricanti limitate; apothecia fuscous black, moderate, sessile, margin thin, paler, flexuose, disk plane, opaque, minutely granuloso-papillate, internally entirely whitish;

hypothecium pale; spores 8, colourless, oblong, slightly curved, simple; paraphyses distinct.

On mountain rocks, common. 1807.

SYN:—Ach. Meth. 38. (1803.) Syn. 28. Nyl. Scand. 222.

FIG:—E. Bot. 1737. Hepp Sporen t. 57. f. 491.

EXS:—Zw. 7. 93. Rabh. 775. Anzi It. S. 250. Hepp 491. Nyl. 59. Fries 404.

GEOG. DISTRIB:—Sweden, France, Germany, Italy, Switzerland.

BOT. PROV:—1...5...7 . 10, 11...18, 19.. 31.

ENGLAND:—Craigforda! Oswestry, Shropshire. *Rev. T. Salwey*. Kildale! Ayton Moor! Yorkshire. *Mr. Mudd*. Horsleyhope Bourn, Durham. Wooler Water foot of Cheviot, Northumberland. *Mr. Winch*. Sheepstor, Devon. *Mr. Holmes*. Mynydd-y-Myfyr! Oswestry, Shropshire.

SCOTLAND:—Garrynahine, Lewis. *Dr. Lindsay*. Braemar. *Rev. J. M. Crombie*.

IRELAND:—Near Glengariff! *Mr. Carroll*.

WALES:—Holyhead! Barmouth! Llyn Cae! Cader Idris, Conway Mountain! Glyder Vach! Snowdonia; Summit of Cader Idris! Crib Goch! Snowdon.

CHANNEL ISLANDS:—Le Fret! Jersey; Jerbourg! Guernsey. *Mr. Larbalestier*.

78. *L. atrofuscescens*, Nyl. cinereo-nigricant or fusco-nigrescent, deplanate, areolato-diffract, sub-opake, areolæ plane or flat; hypothallus black, here and there visible; apothecia black, calnate, plane, at length somewhat convex, margincd, moderate, often sub-angulose, nearly colourless within; hypothecium colourless; epithecium fuscescent; spores 8, colourless, ellipsoid, simple; paraphyses slender, sub-irregular; gelatina hymenea cærulescent, then partly vinoso-rubescient with iodine.

On micaceo-schistose rocks, rare. 1864.

Intermediate between *L. fuscoatra* and *tenebrosa*, but distinguished by the larger spores and other characters.

SYN:—Nyl. in Flora 1866. p. 371. Crombie En. 83.

GEOG. DISTRIB:—Europe.

BOT. PROV:—15.

SCOTLAND:—Lower slopes of Ben Lawers! *Mr. Carroll*. (1864).

79. *L. lithophiliza*, Nyl. cinerascens, firm, unequally deplanate, areolato-diffract or areolato-rimose, thin, (K yellow); apothecia brown-black, innate, plane or convex, immarginate, white internally, bounded beneath with a thin black line; spores 8, colourless, oblong, simple; paraphyses moderate, lurido-fuscescent; hypothecium



with the middle stratum chalky-white, opaque (not hyaline), the lower conceptacular stratum thin black; gelatina hymenea caerulescent with iodine.

On micaceo-schistose maritime rocks, rare. 1868.

Distinct from *L. lithophila* and systematically near *L. phaeops*.

SYN :—Nyl. in Flora 1868. p. 473. Crombie En. 66.

GEOG. DISTRIB :—Europe.

BOT. PROV :—7 .15.

SCOTLAND :—Portlethen, Kincardine. *Rev. J. M. Crombie*.

WALES :—Dolgellsey. *Dr. Holl*.

80. *L. interludens*, Nyl. *whitish or cinereous-white*, thin, *rimuloso-areolate*, *areolæ plane, minutely wrinkled*, nigro-limitate (K pale tawny C—); *apothecia* black, superficial, sessile, rather large, somewhat *plano-convex*, *immarginate* or *with a very thin white thalline margin*, internally colourless; paraphyses slender, distinct, clavate and fuscous at the apices; spores 8, colourless, ellipsoid, simple; gelatina hymenea blue, afterwards the thecæ vinous or violet red.

On calcareous alpine rocks, rare. 1869.

Externally similar to *L. mollis*, which however has the areolæ minutely albo-verrucose; and differs from *L. Kochiana*, which has a mouse-colored thallus and innate apothecia.

SYN :—Nyl. in Flora 1870. p. 33. Crombie in Seem. Journ. Bot. 8. 98.

GEOG. DISTRIB :—Europe.

BOT. PROV :—15.

SCOTLAND :—Morrone! Braemar. *Rev. J. M. Crombie*. (1869).

### †† *Hypothecium* dark.

81. *L. fusco-atra*, Ach. *fuscous or chestnut-coloured or fusco-nigricant or lurido-cinerascent*, *areolate*, *areolæ gibboso convex or plane*, (K yellow C red) smooth and shining; *apothecia* appressed, plane or convex, scattered or confluent, black, naked or sometimes pruinose, margin thin; *hypothecium* thick, black; *thalamium* thin; *spores* 8, colourless, ellipsoid, simple, small.

forma *gibba*, Wahl. chestnut-coloured. areolæ *gibboso-convex*, smooth and shining.

On alpine and mountain rocks, not common.

SYN :—Whitb. Fl. Lapp. 473. (1812.) Ach. Syn. 12.

FIG :—Hllm. Pl. Lich. t. 54. f. 1. a.

EXS :—Leight 215. 239.

GEOG. DISTRIB :—Sweden.

BOT. PROV :—5...15...19...30.

ENGLAND :—Haughmond Hill ! Long Mynd ! Abdon Burf ! Shropshire.

SCOTLAND :—Ben Lawers ; Morrone ; Craig Tulloch ; Hill of Ardo. *Rev. J. M. Crombie.*

IRELAND :—Near Belfast. *Mr. Templeton.* Dunkerron. *Dr. Taylor.* South of Ireland. *Miss Hutchins.*

forma *fumosa*, Ach. *pallido-fuscescent*, *areolato-diffract*, *areolæ flat or slightly concave*, angular, the edges raised up into a very thin sharp margin, smooth and shining (K yellow C red) ; *apothecia appresso-innate*, plane, scattered or confluent, margined.

On mountain rocks and stones, common.

SYN :—Ach. Syn. 12. (1817.) Nyl. Scand. 230.

EXS :—Leight. 216. 304. Zw. 136. Schaer. 470. M. & N. 461. Arn. 191. Anzi Venet. 173.

GEOG. DISTRIB :—Hungary, Switzerland, Bavaria, Italy, Norway.

BOT. PROV :—5 ..7.. 10, 11.. 15...31.

ENGLAND :—Near Newcastle ! Teesdale ! *Mr. Robertson.* Craighforda ! near Oswestry, Shropshire. *Rev. T. Salwey.* Cliffrig ! Ayton Moor ! Cleveland. *Mr. Mudal.* Long Mynd ! Bodbury Ring ! near Church Stretton ; Uffington ! Haughmond Hill ! Shropshire.

SCOTLAND :—Portlethen, Kincardineshire. *Rev. J. M. Crombie.*

WALES :—Corygedol ! near Barmouth. *Rev. T. Salwey.* Capel Curig ! *Mr. Borrer.* Anglesea ! *Rev. Hugh Davies.* Pen-maen-mawr ! Cader Idris ! Barmouth ! Crib Goch ! Snowdon.

CHANNEL ISLANDS :—Noirmont, Jersey. *Mr. Lerbalestier.*

forma *Mosigii*, Ach. *apothecia innata*, plane, *cæsio-pruinose*.

On maritime rocks, rare.

SYN :—*L. fumosa* var. *Mosigii*, Ach. Syn. 12. (1817.) Nyl. Scand. 234.

EXS :—Zw. 137.

GEOG. DISTRIB :—Sweden, Italy.

BOT. PROV :—7.

WALES :—Barmouth !

forma *grisella*, Flk. *lurido-cinerascent* or *lurido-whitish* (K yellow C red) ; *apothecia appresso-innate*, margined, often pruinose.

On mountain rocks, rare.

SYN :—Schaer. Enum. 110. (1850.) Nyl. Scand. 230. *L. diacarysis* ! Sm. E. Bot.

EXS :—Anzi It. S. 287. Anzi Langob. 110. Schær. 625. Körb. 282.

GEOG. DISTRIB :—Sweden, Italy, Switzerland, Lombardy, Bavaria, Pyrenees, Madeira.

BOT. PROV :—5.. 9.. 11 ..15 ..31.

ENGLAND :—Yew How Coniston Water, Lancashire, *Mr. Hailstone*, Durham, *Rev. J. Harriman*, Lyth Hill ! Middle ! Shropshire.

SCOTLAND :—Grampians, Kincardine, *Rev. J. M. Crombie*.

CHANNEL ISLANDS :—Noirmont, Jersey, *Mr. Larbalestier*.

forma *densa*, Stenh. *fusco-nigricant*, areolato-diffract, (K yellow C red.)

On alpine rocks, rare.

SYN :—Fr. Sched. Crit. 14. 9. (1833.) Nyl. Scand. 229.

EXS :—Fries Exs. 405. Leight. 240.

GEOG. DISTRIB :—Sweden.

BOT. PROV :—5. 7 ..15.

ENGLAND :—Haughtmond Hill ! Wrekin Hill ! Long Mynd ! Shropshire.

SCOTLAND :—Grampians. *Rev. J. M. Crombie*.

WALES :—Moel-y-Golfa ! Montgomeryshire.

82. *L. lactea*, (Flk.) *whitish* or *cinerascent*, thin, *smooth*, *rimoso-areolato-diffract*, (K yellow then deep orange-red), areolæ plane ; *apothecia black*, numerous, scattered or aggregate, plane, *innate*, *naked* or *pruinose*, *internally cinerascens* ; *hypothecium dark nigro-fuscous* ; spores 8, colourless, ellipsoid, simple ; paraphyses distinct.

On mountain granitic rocks, rare.

SYN :—Flk. in Schær. Spicil. 127. (1812.) Nyl. Scand. 230.

*L. ambigua*, Fr. L. S. Exs. 407.

EXS :—Schær. 176. Zw. 20. Anzi Langob. 157. Leight. 301.

GEOG. DISTRIB :—Switzerland, Pyrenees, Sweden, Tyrol.

BOT. PROV :—7.. 10.. 15...24.

ENGLAND :—Thirsk, Yorkshire, *Mr. Baker*.

SCOTLAND :—Ben Lawers, *Adm. Jones*. Morrone and Glen Dee, Braemar ; Falls of Tummell, Blair Athole. *Rev. J. M. Crombie*.

IRELAND :—Limerick, *Adm. Jones*.

WALES :—Capel Curig ! *Mr. Borrer*. Barmouth ! Glyder Vach ! Llambeth ascent of Snowdon ! Conway ! Pen-maen-mawr ! Crib Goch ! Snowdon.

83. *L. sarcogyniza*, Nyl. dusky cinereo-virescent or sub-olivaceous, epake, thin, indeterminate, areolate, areolæ plane or evanescent ; apothecia black, plane, margin often flexuose, dusky within ; hypothecium sub hymeniale distinctly fuscous, its middle stratum nearly colourless ; epithecium black ; spores 8, colour-

less, oblong, simple; *thalamium* colourless; paraphyses moderate, nigricanti-clavate at the apex; gelatina hymenea intensely blue.

On mountain and maritime granitic rocks, rare. 1868.

Approaching *L. sarcogynoides*, Krbr. but differs in the colorless thalamium and other characters.

SYN:—Nyl. in Flora 1868. p. 475. Crombie En. 82.

EXS:—Zw. 22. Schær. 187.

GEOG. DISTRIB:—Switzerland.

BOT. PROV:—15.

SCOTLAND:—Morrone; near Nigg, Kincardine. *Rev. J. M. Crombie*. (1868).

84. *L. nitida*, (Schær.) *olivaceo-fuscous*, crustaceous, nigro-limitate, *areolato-diffract*, *areolæ shining*, flat and dispersed in some states, *concave*, *margins upturned*, *whitish and sub-pulverulent* (K—C—); *hypothallus black*, *often predominating*; *apothecia black*, at first *innate in the areolæ*, *eventually superficial* and sessile, plane, solitary or confluent, margin thin, prominent, entire or flexuose; *hypothecium nigro-fuscous*; spores 8, colourless, ellipsoid, simple.

On alpine and maritime rocks, not unfrequent. 1856.

Approaching *L. fusco-atra* var. *dcusta*, in external appearance but with different reaction.

SYN:—*L. fumosa* var. *nitida*, Schær. Enum. 110. (1850).

FIG:—Hoffm. Pl. L. t. 49. fig. 2. a. b. Hepp Sporen t. 15. f. 131.

EXS:—Hepp 131. Anzi Langob. 84. A. 85. Leight. 278. (status hypothallo prædominante).

GEOG. DISTRIB:—Europe.

BOT. PROV:—7.

WALES:—Barmouth! (1856.) Glyder Vach! Pass of Llanberis! Snowdon.

85. *L. sub-Kochiana*, Nyl. *cinereous*, crustaceous, thin, nigro-limitate, *areolato-diffract*, *areolæ plane*, (K—C—); *apothecia black*, numerous, scattered, *innate* or *innato-sessile*, plane, margin thickish, sometimes slightly paler; *hypothecium thick*, *nigro-fuscous*; spores 8, colourless, ellipsoid, simple (size of those of *L. fusco-atra*.)

On sub-alpine rocks, not common. 1864.

Like *L. fusco-atra* var. *grisella*, but distinguished by different reaction, which also separates it from *L. tessellata*, in which also the areolæ are convex.

SYN :—*L. tessellata* f. *sub-Kochiana*, Nyl. in Flora 1869. p. 85. Scand. p. 227.

GEOG. DISTRIB :—Sweden, Germany, Italy.

BOT. PROV :—7...15.

SCOTLAND :—Kincardine. *Rev. J. M. Crombie*.

WALES :—Moel-y-Golfa ! Montgomeryshire. (1864.) Pen-maen-Mawr ! Caernarvonshire.

\*\*\*\*\* *Thallus continuous, rimulose, plane.*

† *Hypothecium pale.*

86. *L. Taylora*, (Salw.) creamy or brownish-white, tartareous, thickish, effuse, smooth, rimuloso-diffract (K deep yellow C—) ; apothecia fusco-rufescent, immersed or superficial, numerous, scattered, plane or plano-convex, margin thin, entire or immarginate ; hypothecium pale yellowish-brown, prolonged downwards into the thallus ; spores 8, colourless, elliptical, large, simple, granulate ; paraphyses distinct.

On mountain rocks, not common. 1814.

SYN :—*Biatora Taylora*, Salw. in Trans. Penzance Nat. Hist. Soc. 1853. p. 144. *Lecidea*, Mudd Man. 199. *Bæomyces anomalus*, Tayl. Fl. Hib. 2. 79. *Lecidea lævigata*, Nyl. Enum. 143. *Crombie* Enum. 65.

FIG :—E. Bot. 2580.

EXS :—Leight. 283.

GEOG. DISTRIB :—France, Italy.

BOT. PROV :—1...5...7...19.

ENGLAND :—Ilfracombe. *Miss Atwood*. Gulval Cairn, ! Penzance. *Rev. T. Salwey*. Bolt Head, Devon. *Dr. Holl*. Plymouth. *Mr. Holmes*. Spout Valley, ! Long Mynd near Church Stretton, Shropshire.

IRELAND :—Blackwater co. Kerry. *Dr. Taylor*. Glena and Glen Flesk near Killarney. *Sir T. Gage*. (1814).

WALES :—Barmouth ! *Rev. T. Salwey*. Cwm Bychan. *Mr. Borrer*. Cader Idris !

87. *L. leiotea*, Nyl. fuscous or griseo-nigricant, thin, varnished, smooth, determinate, continuous, obsoletely rimulose ; apothecia black, plane, obtusely margined or margin indistinct, adnate ; hypothecium colourless ; spores 8, colourless, ellipsoideo-oblong, simple ; paraphyses moderate, thicker at the fuscous apices and there generally septato-articulate ; gelatina hymenea slightly cærulescent.

On sub-alpine basaltic rocks, rare. 1867.



SYN :—Nyl. in Flora 1867. p. 328. Crombie En. 85.

GEOG. DISTRIB :—Europe.

BOT. PROV :—19.

IRELAND :—Crogham ! Killarney. *Mr. Carroll*. (1867).

†† *Hypothecium dark*

88. *L. contigua*, Fr. *greyish-white* or even creamy, tartareous or thin, *contiguous or areolate*, areolæ plane, smooth or rugose, hypothallus black ; *apothecia arising from the thallus*, sessile, plane or convex, *roughish*, margin thick, prominent and obtuse ; *hypothecium thick, blackish brown* ; *thalamium white* ; spores 8, colourless, oblong, large, simple.

forma *limitata*, Leight. *bluish-grey*, thin, contiguous, smooth, *limited by black hypothallus* ; apothecia moderate, sessile, plane or plano-convex, with pale or blackish-brown pruina.

On rocks, common.

SYN :—*L. contigua*, *a*, *a*. Fries L. Eur. 298. in part (1831.) excl. syn.

EXS :—Leight. 155.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1, 2, 3. .5...7...10.. 18, 19...31.

ENGLAND :—Sussex ! *Mr. Borrer*. Lanbrough-rigg ! Cockshaw near Aytou ! Yorkshire. *Mr. Mudd*. Tors of Dartmoor ; Exeter ; Dartmouth, Devon. *Mr. Parfitt*. Tiptree Heath, Essex. *Mr. Varenne*. Plymouth. *Mr. Holmes*. Haughmond Hill ! Soudley Quarries ! near Hope Bowdler ! Shropshire ; Wapley Hill ! Herefordshire.

SCOTLAND :—Garrynahine, Lewis ; Stennis, Orkney. *Dr. Lindsay*.

IRELAND :—Near Cork ! *Mr. Carroll*.

WALES :—Pen-maen-mawr ! Carnarvonshire ; between Corwen and Bala ! Llyn Cae ! Cader Idris.

CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier*.

forma *platycarpa*, Fr. *greyish-white*, diffuse, thin, *rimulose, rugulose or evanescent* ; *apothecia very large, flat and expanded* ; margin paler.

On rocks, common.

SYN :—Fries L. Eur. 300. (1831.) Nyl. Scand. 224.

FIG :—Massal. Ric. fig. 125.

EXS :—Zw. 18. 24. Nyl. 141. Mudd 179. Fellm. 186. Anzi It. S, 288.

GEOG. DISTRIB :—Germany, Pyrenees, Switzerland, E. Lapland, Italy, Hungary, France, N. Zealand.

BOT. PROV :—5...7...10...15.. (19—30).

ENGLAND :—Ayton Moor ! Cleveland. *Mr. Mudd.* Haughmond Hill ! Abdon Burf ! Shropshire.

SCOTLAND :—Amulree ! Perthshire. *Dr. Lindsay.*

IRELAND :—On Mountains. *Mr. Carroll.*

WALES :—Pen-y gwydd ! Snowdon ; Eglswg rocks ! near Llan-gollen ; Crib Goch ! Nant-Gwynant ! Snowdon.

*forma hydrophila*, Fr. *milky* or *cinerascens*, very thin, smooth, continuous or rimose or dispersed, *hypothecus* conspicuous, black ; apothecia plane or tumid and convex, naked.

On water-washed rocks, frequent.

SYN :—Fries L. Eur. 301. (1831).

GEOG. DISTRIB :—Sweden.

BOT. PROV :—7...19.

IRELAND :—Near Cork ! *Mr. Carroll.*

WALES :—Llyn Aran ! Llyn Cae ! and Gou Craig ! Cader Idris ; Moel-y-Golfa ! Aberdovey ! Crib Goch ! Snowdon.

*forma leprosa*, Leight. *dirty pale-brown*, scurfy or leprose, in round patches, thin, minutely verrucose ; apothecia small, sub-concentric, sub-immersed, plane or convex, margin paler.

On crumbly soft rocks and stones, common.

Exs :—Leight. 156.

GEOG. DISTRIB :—France, Italy.

BOT. PROV :—1, 2, 3...5...8...10...19.

ENGLAND :—Sussex ! *Mr. Borrer.* Penzance ! Cornwall. *Rev. T. Salway.* Lanbraughrigg ! Guisbro' Moor ! *Mr. Mudd.* Chelmsford ! Essex ! *Mr. Piggot.* Congerstone ! Leicestershire. *Rev. A. Bloxam.* Haughmond Hill ! Steeraway Line Rocks ! Lyth Hill ! Shropshire.

IRELAND :—Ballinhassig ! Me Gillicuddy's Rocks ! Kerry ! Musheragh Mount co. Cork ! *Mr. Carroll.*

*forma calcarea*, Fr. *creamy-white*, tartareous, contiguous, smooth or rimulose or areolate, areolæ slightly convex ; apothecia rather small, appressed, plane or plano-convex.

On rocks not unfrequent.

SYN :—Fries L. Eur. 302. (1831.) excl. syn.

Exs :—Anzi Venet. 170. Schær. 471. Anzi It. S. 285. Anzi Langob. 158. Fellm. 183. Maudon 58.

GEOG. DISTRIB :—Switzerland, Pyrenees, Italy, E. Lapland, Lombardy, Madeira.

BOT. PROV :—7...19.

IRELAND :—Ballyoran Wood, Fermoy ! ; near Cork ! *Mr. Carroll.*

WALES :—Aber ! ; Cwm Glas ! Snowdon ; Moel Siabod !

*forma nobilis*, Fr. ? *pale ashy-bluish-grey*, very thick and tartareous, areolate, areolæ turgid and convex ; apo-

*thezia* large, more or less convex and hemispherical, slightly pruinose, margin frequently paler.

On mountain rocks, frequent.

SYN :—Fries L. Eur. 301. (1831).

EXS :—Mudd 180. Arn. 192. Fellm. 185.

GEOG. DISTRIB :—Pyrenees, Italy, E. Lapland.

BOT. PROV :—5.. 7.. 10...14.

ENGLAND :—Cliffrigg, ! Cleveland. *Mr. Mudd.* Caer Caradoc ! Laurence Hill ! Wrekin ! Pontesford Hill ! Long Mynd and Bodbury Ring ! near Church Stretton ! Shropshire.

SCOTLAND :—Pentland Hills ! *Dr. Greville.*

WALES :—Aber ! Diganwy ! Caernarvonshire ; Craig Breiddin ! Montgomeryshire ; between Llangollen and Corwen ! ; Moel Siabod ! Snowdon ! Barmouth !

forma *Hoffmanni*, Leight. dirty-cream-colour, thick, tartareous, *rimuloso-areolato-diffract*, *areolæ flattish* ; *apothecia* large, sub-innate or sessile, flat or convex.

On rocks, rare.

SYN :—*Verrucaria contigua*, Hoffm. Fl. Germ. 2. 184. (1798).

FIG :—Hoffm. Pl. Lich. t. 62.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2...19.

ENGLAND :—Sussex ! *Mr. Borrer.*

IRELAND :—Musheragh Mount ! co. Cork. *Mr. Carroll.*

forma *flavicunda*, Ach. rusty-red, thick, tartareous, *areolate*, *areolæ flat* ; *apothecia* large, appressed, black, flat or plano-convex, more or less albo-pruinose.

On rocks, frequent.

SYN :—Ach. L. U. 166. (1810.) Syn. 22. Nyl. Scand. 224.

FIG :—Mass. Ric. fig. 143.

EXS :—Zw. 16. 17. Schær. 186. Anzi Venet. 174.

GEOG. DISTRIB :—Italy, Pyrenees, Tyrol, Switzerland, Sweden, Finland.

BOT. PROV :—5...7...15.

ENGLAND :—Titterstone Clee Hill ! Shropshire. *Rev. T. Salwey.* Brown-Clee Hill ! Shropshire.

SCOTLAND :—Loch-na-gar, ! Braemar ; Amulree ! Perthshire. *Dr. Lindsay.*

WALES :—Moel Eilio ! Moel Hebog ! *Mr. Borrer.* Llyn Cae ! Cader Idris ; Barmouth ! very summit of Snowdon ! Moel Siabod ! Penygwrydd ! Crib Goch ! Nant Gwynant ! Snowdon.

forma *aggrata*, Mudd. greyish-brown or grey, effuse, thin, sub-tartareous, *granuloso-rimoso-areolate* ; *apothecia* minute, numerous, aggregated, convex, immarginate ; hypothecium black ; spores 8, colourless, oblong, simple.

On rocks and walls, rare.

SYN :—Mudd Man. 208. (1861).

EXS :—Mudd 175.

GEOG. DISTRIB :—Europe.

BOT. PROV :—3.. 7...10.

ENGLAND :—Lanbraugh-rigg and near Battersby ! Cleveland. *Mr. Mudd.* (1861.) Kelvedon, Essex. *Mr. Varenne.*

WALES :—Cwm Glas ! Snowdon.

Mr. Crombie in Seem. Journ. Bot. 8. 98. mentions having found a var. *notabilis*, Nyl. Scand. 225. on Morrone, Braemar, thus characterised by Nyl. l. c. "thallo albo vel albido, inæqualiter minute granuloso vel fere leproso, passim disperso, passim acervulato (tunc faciei prope ut in *Stereocaulo condensato*) ; apotheciis prominulis planis (trachylloideis) opacis, margine parum vel haud distincto."

89. *L. albo-cærulescens*, (Wulf.) creamy-white, opaque, continuous, smooth ; apothecia appressed, plane, cæsio-pruinose, margin thinnish, more or less flexuose ; hypothecium thickish, dark brown-black ; spores 8, colourless, narrowly oblongo-elliptical, simple, large.

On rocks in mountainous districts, not common.

SYN :—Wulf. ap. Jacq. Coll. 2. 184. (1788.) Ach. Syn. 29. excl. var. *L. contigua* var. *albo-cærulescens*, Nyl. Scan. 224.

FIG :—Hoffm. Pl. Lich. t. 14. f. 2.

EXS :—Zw. 129. A. & B. Mudd 181. Anzi It. S. 282. Schær. 471.

GEOG. DISTRIB :—Germany, Italy, Pyrenees, Hungary, Austria, Switzerland.

BOT. PROV :—1...10.

ENGLAND :—Langbraugh-rigg, ! Cleveland. *Mr. Mudd.* Gardrington, Torbay. *Mr. Parfitt.*

Not to be confounded with *L. cyanca* (Flk.) which is similar in external appearance, but has the apothecia white within and the epithecium when wetted becomes pallido-rufescent. The hypothecium is sometimes interrupted, sometimes continuous and variable in thickness. The size of the spores incline one to consider that it may be a variety of *L. contigua*.

90. *L. confluens*, (Webr.) dull smoky-grey, tartareous, continuous, areolato-rimulose, smooth or slightly rugulose, effuse or sub-determinate ; hypothallus black ; apothecia numerous, crowded or scattered, large, confluent, appressed, margin thin, slightly prominent, flexuose ; disk plane, in age convex, of full opaque black, very smooth, soft and velvety ; hypothecium dense, nigro-fuscous ; thalamium pale ; spores 8, colourless, ellipsoid, simple, small, half the size of those of *L. contigua*.

On mountain rocks, not frequent.

SYN :—Web. Spicil. 180. (1778.) Ach. Syn. 16. pro. p. Nyl. Scand. 225.

FIG :—Web. Spicil. t. 2. Hoffm. Pl. Lich. t. 19. f. 1. Hepp Sporen t. 15. f. 125.

EXS :—M. & N. 463. Schær. 228. 446. Anzi It. S. 286. Hepp 125.

GEOG. DISTRIB :—Switzerland, Hungary, Italy, Pyrenees.

BOT. PROV :—1...3...7...15...31.

ENGLAND :—Chudleigh Rocks, Devon. *Mr. Purfitt*. Kelvedon, Essex. *Mr. Varenne*. Plymouth. *Mr. Holmes*.

SCOTLAND :—Grampians, common. *Rev. J. M. Crombie*.

WALES :—Aberdovey ! *Rev. A. Bloxam*. Diganwy ! near Conway.

CHANNEL ISLANDS :—Jersey. *Mr. Iarbaletstier*.

91. *L. consentiens*, Nyl. whitish, continuous, moderate, smoothish, rimoso-diffract, (K—C—) ; cephalodia pale ; apothecia black, innato-impressed, plane, obtusely margined ; hypothecium thin, blackish ; spores 8, colourless, ellipsoid, simple, large ; paraphyses slender ; epithecium fuscous ; gelatina hymenea cærulescent then fulvescent with iodine.

On alpine rocks, rare. 1866.

Not unlike some state of *Lecanora cinerea* (L).

SYN :—Nyl. in Flora 1866. p. 371. Leighton in Ann. and Mag. Nat. Hist. Sep. 1869. Crombie En. 80.

GEOG. DISTRIB :—Europe.

BOT. PROV :—7...15.

SCOTLAND :—Ben Lawers. *Adm. Jones*.

WALES :—Llyn Cae ! Cader Idris.

92. *L. phæops*, Nyl. whitish cream-coloured or dirty whitish-brown, tartareous, thin, determinate, continuous, smooth, rimulose (K yellow C yellow) ; apothecia fuscous, small, scattered, innate, plane, immarginate, internally fuscous ; hypothecium darkly rufescent ; spores 8, colourless, narrowly ellipsoid, simple ; paraphyses indistinct.

On wet alpine rocks, not common. 1844.

SYN :—Nyl. Scand. (1861.) p. 296. Salweg in Trans. Bot. Soc. Edin. 7. 554.

GEOG. DISTRIB :—Europe.

BOT. PROV :—7...15...19...26.

SCOTLAND :—Ben Cruachan ; Ben Lawers. *Rev. J. M. Crombie*.

IRELAND :—Brandon Mount and Connor Cliffs ; Mangerton, Killybegny. *Mr. Carroll*. near Dunkerron ! Cappamore Hill ! co. Kerry. *Dr. Taylor*. Connemara. *Dr. Moore*.

WALES :—Plinlimmon. *Rev. T. Salweg*. (1844.) Llyn Aran ! Llyn Cae ! Cader Idris ; Crib Goch ! Snowdon ; Capel Curig ! Cwm Idwall ! Cwm Bochlwyd ! Cwm Tryfan ! Cwm Cywion ! Glyder Vach ; Llyn Cwlyd !



Mr. Crombie in litt. mentions a form *major* in which the thallus is thicker and the apothecia larger (twice as large).

93. *L. umbonella*, Nyl. *whitish* or *pale-yellow*, thin, determinate, in *orbicular irregular patches, rimoso-diffract*, smooth (K yellow then red); *apothecia black*, small, *innate*, *marginate*, generally *subgyrose* or *umbonate* in the centre; *hypothecium fuscous* or *fuscouscent*, (the umbo and perithecium fusco-nigricant, as seen in a thin section); *epithecium* nearly colourless; spores 8, colourless, ellipsoid, simple; paraphyses moderate; *gelatina hymenea* bright blue with iodine.

On micaceo-schistose alpine rocks, rare. 1866.

Systematically near *L. gyrizans*, Nyl. spermatia cylindrical straight.

SYN:—Nyl. in Flora 1866. p. 372. Crombie En. 85.

GEOG. DISTRIB:—Europe.

BOT. PROV:—15.

SCOTLAND:—Morrone, Braemar! Adm. Jones. Cairn Turc, Braemar. Rev. J. M. Crombie.

94. *L. melaphana*, Nyl. *nigricant*, thin, opaque, *diffracto-unequal*; *apothecia black*, smallish, convex, immarginate, *duky within*; *hypothecium slightly infusate* in lower portion; *epithecium cærulescent*; spores 8, colourless, oblong, simple; *thalamium cærulescent* upwards; paraphyses indistinct; *gelatina hymenea cærulescent*, then partly violet with iodine.

On calcareous mountain rocks, rare. 1869.

Naturally near *L. aphanoides*, but distinct by the black thallus, the infusate hypothecium, &c. approaching *L. paraphana*, Nyl.

SYN:—Nyl. in Flora 1869. p. 83. Crombie En. 84.

GEOG. DISTRIB:—Europe.

BOT. PROV:—15.

SCOTLAND:—Craig Guie, Braemar. Rev. J. M. Crombie. (1869).

95. *L. interjecta*, Nyl. *whitish* or *cinerascent*, unequal, thin, *rimoso-diffract*, indeterminate (C red); *apothecia black*, moderate, plane, margined, *duky within*; *hypothecium fuscous*; *epithecium* nearly colourless or slightly lutescenti-fuscouscent or dusky; spores 8, colourless, ellipsoid, simple; *gelatina hymenea cærulescent*, then vinous-red with iodine.

On sandstone rocks in sub-alpine places, rare. 1866.

SYN:—Nyl. in Flora 1866 p. 418; Lapp. Or. 177. Crombie En. 81.

GEOG. DISTRIB:—Europe.

BOT. PROV:—5.

ENGLAND :—Oswestry, Shropshire. *Rev. T. Salwey*. 1866.

96. *L. pelobotrya*, (Whlnb.) *whitish* or *livid-grey*, *very thick*, *tartareous*, *continuous*, *rimose*, *smooth*, *unequally raised up into large plano-convex masses* or *pulvinuli*, (K yellow C—), on which are the *apothecia* which are at first minute and *immersed*, then *superficial*, *sub-urceolate*, *sub-immerso-sessile*, solitary or *congregate*, *blackish-brown*, *margin very thick*, *somewhat polished*, *flexuose*; *hypothecium* dark-brown; *paraphyses* crowded, distinct, slender; spores 4-8, colourless, ellipsoid or oblongo-ellipsoid, simple.

On alpine micaceo-schistose rocks, very rare. 1869.

SYN :—*Urccolaria*, Whlnb. in Ach. Meth. Suppl. 31. (1803.) Ach. L. U. 333. Syn. 138. *Lichen*, Whlnb. Fl. Lapp. 413. *Lecanora*, Smrf. Lapp. 69. Nyl. Scand. 155.

GEOG. DISTRIB :—Finmark, Norway.

BOT. PROV :—15.

SCOTLAND :—Ben Lawers ! *Messrs Jones & Crombie*.

\*\*\*\*\* *Thallus evanescent*.

† *Hypothecium pale*.

97. *L. mutabilis*, Fee. *evanescent*; *apothecia* *rufofuscescent*, small, scattered, sessile, plane, margin thin, entire; *hypothecium* colourless; spores 8, colourless, *rotundo-oblong*, simple, large.

On trees, rare. 1851.

SYN :—Fée Suppl. 105. (1837.) *Crombie Enum.* 120.

FIG :—Fée Suppl. t. 42. f. 16.

GEOG. DISTRIB :—Central America, Mexico, Europe.

BOT. PROV :—19. 24...26...31.

IRELAND :—Glencar, Kerry ! Mount Shannon, Limerick; Lough Cooter, Galway; Killaloe, Clare, Blackwater Bridge, and Old Droimore, Kerry; Castlebernard Park, Bandon; Mangerton. *Mr. Carroll*.

CHANNEL ISLANDS :—Rozel, Jersey ! *Mr. Larbalestier*. (1851).

†† *Hypothecium dark*.

98. *L. diducens*, Nyl. *evanescent*; *apothecia* *aggregate*, black, moderate, plane, margin *elevated*, *flexuose*, *lobate*, *dark within*; *hypothecium* *fuscous*; spores 8, colourless, ellipsoid or oblong, small, simple; *paraphyses* thick, distinct, with black clavate apices; *gelatina hymeneæ* *cærulescent* with iodine.

On felspathic rocks, rare.

SYN :—Nyl. in Flora 1865. p. 148. Crombie Enum. 85.

EXS :—Larbal. 39.

GEOG. DISTRIB :—Europe.

BOT. PROV :—31.

CHANNEL ISLANDS :—Noirmont ! Le Fret Common ! Jersey.  
Mr. Larbalestier.

99. *L. obsoleta*, Nyl. *evanescent* ; apothecia black, minute, opaque, margin obtuse or indistinct, concolorous within ; hypothecium darkly fuscous ; epithecium dilute-nigrescent ; spores 8, colourless, oblong, simple or with an obsolete septum ; paraphyses moderate, distinct, apices sub-clavato-incrassate, nearly colourless ; gelatina hymenea scarcely tinged with iodine.

On chalky earth, rare. 1865.

Systematically near *L. neglecta*, Nyl.

SYN :—Nyl. in Flora 1865. p. 604. Crombie En. 92.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2.

ENGLAND :—Near Lewes on the Sussex Downs. Adm. Jones. (1865).

100. *L. jurana*, Schær. white, tartareo-farinose, unequally disperso-granulose or evanescent ; apothecia superficial, sessile, scattered or aggregate, black, margin thick, prominent, flexuose, internally black ; hypothecium and epithecium black ; thalamium hyaline ; spores 8, colourless, ellipsoid, simple ; paraphyses distinct ; gelatina hymenea blue with iodine.

On calcareous rocks, not common. 1869.

Possibly only a variety of *L. contigua*.

SYN :—Schær. Enum. 123. (1850.) Nyl. Prodr. 125.

EXS :—Anzi Langob. 356.

GEOG. DISTRIB :—Lombardy, Hungary.

BOT. PROV :—7...15.

SCOTLAND :—Castleton of Braemar. Rev. J. M. Crombie.

WALES :—Llyn Aran ! Llyn Cae ! Cader Idris. (1869). Crib Goch ! Snowdon.

101. *L. gelatinosa*, (Flk.) ceruginose, leproso-gelatinous, evanescent ; apothecia black, appressed, plane, immarginate, scattered, moderate, pale-brown within ; hypothecium pale-brown ; spores 8, colourless, ellipsoid, simple ; paraphyses indistinct ; gelatina hymenea not coloured by iodine.

On earth in sub-alpine places, not common.

SYN :—Florke in Berl. Mag. 1809. p. 201. Schær. Enum. 137. Ach. Syn. 26. Nyl. Prodr. 110.

FIG :—Hepp Sporen. t. 57. f. 493.

EXS :—Schær. 205. Hepp 493. Zw. 82. M. & N. 843. Leight. 353.

GEOG. DISTRIB.—Switzerland, Germany, France.

BOT. PROV :—5 10.. 19.. 23...30.

ENGLAND :—Cliffrigg ! Guisbro' Moor ! Yorkshire. *Mr. Mudd*. Stiperstones Hill ! Shropshire.

IRELAND :—Kelley's Glen and near Dublin ; Slemish Mountain co. Antrim. *Dr. Moore*. near Bantry. *Miss Hutchins*.

102. *L. fusco-rubens*, Nyl. *cinerascent*, *very thin, effuse, granuloso-unequal or evanescent ; hypothallus fuscous ; apothecia* not very numerous, scattered, sessile, *fuscous-black, plano-convex, immarginate, internally fuscous ; hypothecium thick, fuscous ; epithecium pallido-rufescent ; spores* 8, colourless, ellipsoid or globoso-ellipsoid, simple.

On alpine rocks, rare. 1863.

Near *L. sanguineo-atra*, Ach.

SYN :—Nyl. Animad. Scand. in Bot. Notis. 183. (1853.) Prodr. 106. Scand. 199. Salwey in Edin. Bot. Soc. Trans. 7. 551.

GEOG. DISTRIB :—Sweden, Norway, Europe, Canaries.

BOT. PROV :—2...7...15.. 19. 30.

ENGLAND :—Fulking Downs, Sussex. *Mr. Lorbalestier*.

SCOTLAND :—Ben Lawers ; Craig Guie ; Craig Tulloch ; *Rev. J. M. Crombie*.

IRELAND :—Glenarm ; *Adm. Jones*. near Cork. *Mr. Carroll*.

WALES :—Aber Ty Gwyn near Dolgelley. *Rev. T. Salwey*. (1863).

103. *L. calcivora*. (Flrh.) *greyish-white or white, thin, effuse, evanescent ; apothecia* small, scattered, *calcivorous, foveolato-immersed* in the rock, black, cæsio-pruinose or naked, internally cinerascens in the middle ; margin thin, evanescent ; hypothecium fuscous below ; spores 8, colourless, elliptico-oblong, simple, granulate ; paraphyses indistinct ; gelatina hymenica blue then vinous-red with iodine.

On calcareous rocks, frequent. 1794.

Externally and generally similar to, but not to be confounded with *Verrucaria immersa*, Leight. Ang. Lich. t. 25. f. 2.

SYN :—Ehrh. Cr. Exs. 244. (1793.) Nyl. Prodr. 135. *L. immersa*, (Schrad.) Ach. Meth. 34. *Biatora Metzleri*, Körb. Par. 162.

FIG :—E. Bot. 193. Leight. Ang. Lich. t. 24. f. 5.

EXS :—Nyl. 138. Schær. 201. Anzi It. S. 266. 267. Leight. 94. Anzi 951.

Geog. DISTRIB:—France, Switzerland, Europe.

Bot. PROV:—7, 8...10, 11...(19—30).

ENGLAND:—Derbyshire. *Sir J. E. Smith*. (1794.) Ingleborough. *Dr. Carrington*. near Thirsk. *Mr. Baker*. near Masham, Yorkshire. *Mr. Mudd*. Durham and Northumberland. *Mr. Winch*.

IRELAND:—Not uncommon. *Mr. Carroll*.

WALES:—Eglsag rocks! near Llangollen; Great Orme's Head!

101. *L. endopella*, Leight, *evanescent*; *apothecia* black, numerous, crowded, *plano-depressed*, *margin obliterated*, *internally pallido-fuscous*; *hypothecium pallido-fuscous*; *spores* 8, colourless, *very minute*, ellipsoid, *simple*, *with 2 rather large nuclei*.

On old fir palings, rare. 1870.

SCOTLAND:—Blair Athole! *Rev. J. M. Crombie*.

This comes very near to Schaer. 529, but in that the spores are larger, and linear-oblong; without nuclei nevertheless both may be only states of the same lichen.

105. *L. symphorella*, Nyl. *evanescent or nearly so*; *apothecia* black, minute, somewhat convex, immarginate, *aggregato-acervulate*, acervuli composed of many connate apothecia, *internally concolorous*; *spores* 8, colourless, oblong, simple; paraphyses moderate, indistinct; epithecium darkly *caerulescent* or *fuscouscent*; *hypothecium* and *perithecium brunneo-infusate*; *gelatina hymenea* and *asci* at first blue, then red or vinous-violet with iodine.

On weathered quartzose stones, rare. 1869.

Syn:—Nyl. in Flora 1870, p. 35. Crombie in Scam. Journ. Bot. 8. 99.

Geog. DISTRIB:—Europe.

Bot. PROV:—15.

SCOTLAND:—Summit of Morone; Braemar. *Rev. J. M. Crombie*, (1869.)

106. *L. enclitica*, Nyl. thallus nearly *evanescent*, *apothecia* black, minute, convex, immarginate, *disperset*; *internally obscure*; epithecium *nigrescent*; paraphyses indistinct; *hypothecium fuscous*; *spores* 8, colourless, oblong, simple; *gelatina hymenea* *caerulescent* then **dusky-vinous with iodine**.

On old fir poles in subalpine localities, rare. 1870.

Syn:—Nyl. Lapp. Or. 148. (1864.) Crombie in Scam. Journ. 9. 178.

Fl.:—Arn. 498.

Geog. DISTRIB:—E. England.

Bot. PROV:—15.



SCOTLAND:—Pass of Killiecrankie in Blair Athole. *Rev. J. M. Crombie.*

B. Spores 1-septate, brown.

\* *Hypothecium* dark.

107. *L. canescens*, (Dicks.) white or albo-glaucous, sub-tartareous, orbicular, adnate, radiato-plicate, sorediate, circumference truncato-or repando-lobate, surface generally smooth, minutely albo-granuloso-pruinose; hypothecium black; apothecia rare, small, black, plane, depressed, central, crowded, cæsio-pruinose, margin paler, entire, flexuose; spores 8, fuscous or fusco-nigricant, elliptico-oblong, 1-septate or bilocular and nucleolate.

On old trees, walls and rocks, frequent but rare in fruit. 1785.

SYN:—Dicks. Crypt. 1. 10. (1715.) Ach. Syn. 54. Nyl. Prodr. 119.

FIG:—Dicks. Crypt. 1. t. 2. f. 5. E. Bot. 582. Hepp Sporen t. 61. f. 527. 528.

EXS:—Hepp 527. 528. Schær. 576. Welw. Lusit. 54. Nyl. 137. Lärbar. 33. Bohl. 68. M. & N. 1152. Anzi It. Sup. 290.

GEOG. DISTRIB:—Normandy, Germany, Switzerland, Portugal, France, Italy, Africa, E. Indies.

BOT. PROV:—1, 2, 4...5...10, 11.. 15...19...24, 25...30, 31.

ENGLAND:—Middleton! near Oswestry, Shropshire. *Rev. T. Salwey.* near St. German's, Cornwall; Isle of Wight; Battenhall! Worcester *Dr. Holl.* Essex! *Mr. Piggott.* near Ayton! Cleveland. *Mr. Mudd.* Gainford and Houghton-le-Spring, Durham; near Hexham. and Brinkburn Priory, Northumberland. *Mr. Winch.* Chudleigh; Exeter, Devon. *Mr. Parfitt.* Midland Counties. *Mr. Purton.* Cheam; Hendon; Tunbridge Wells. *Rev. J. M. Crombie.* Plymouth. *Mr. Holmes.* Sutton! near Shrewsbury; Tong Church! Salop.

SCOTLAND:—Appin; Castleton. *Rev. J. M. Crombie.*

IRELAND:—Near Belfast. *Mr. Templeton.* Rathrouan, Clonmel. *Mr. Gough.* co. Wicklow. *Mr. Moore.* Robert's Cave, Cork; Carri-gogummel, Limerick, and Dromoland, Clare. *Mr. Carroll.*

CHANNEL ISLANDS:—Fliquet Bay! Jersey; Guernsey; Sark. *Mr. Larbalestier.*

108. *L. saxorum*, (Mass.) dirty yellowish-white, thin, minutely areolato-rimulose, plane, nigro-limitate; (K yellow C orange-red); apothecia numerous, scattered, sessile, plane, black, margin thick, entire, rather paler; hypothecium black, or nigro-fuscous; spores 8, fuscous, oblong, 1-septate, somewhat curved, nucleolate.

On rocks, not common. 1870.

Not to be confounded with *L. disciformis*, which has a different chemical reaction, larger spores, and other characteristics.

SYN :—*Buellia saxorum*, Mass ! Ric. 82. (1852.) *Buellia leptoclina*, Mass. Geneac. 20. *Lecidea disciformis*, Fr. Nyl ! Scand. 236. (in part).

FIG :—Mass. Ric. fig. 169. Hepp Sporen t. 86. f. 752.

EXS :—Nyl. L. P. 60. Larbal. 35. Mass. 347. Hepp 752.

GEOG. DISTRIB :—Italy, France, Pyrenees.

BOT. PROV :—10...31.

ENGLAND :—Farndale ! Yorkshire. *Mr. Mudd*.

CHANNEL ISLANDS :—Noirmont ! Jersey. *Mr. Larbalestier*.

109. *L. saxatilis*, (Schær.) *white* or *whitish*, moderately thick, tartareous, *rugoso-unequal*, (K faint yellow C orange) ; *apothecia minute*, scattered, *at first innate, then sessile, black*, plane, margin thin, entire ; *hypothecium nigro-fuscous* ; *spores 8, fuscous, oblong, 1-septate, small*.

On sub-alpine rocks, not common.

SYN :—*Calicium saxatile*, Schær. in Natur. Anz. Winterm. 35. (1821.) Enum. 166. Nyl. Scand. 237.

FIG :—Hepp Sporen t. 17. f. 145.

EXS :—Hepp 145. Zw. 140. Arn. 166. *a. b.* Rabh. 800. Anzi Langob. 198. Schær. 240.

GEOG. DISTRIB :—Bavaria, Switzerland, Lombardy, Italy.

BOT. PROV :—7...15...30.

SCOTLAND :—Near Nigg, Kincardine. *Rev. J. M. Crombie*.

IRELAND :—Divis Mountain co. Antrim. *Dr. Moore*.

WALES :—Barmouth. *Rev. T. Salwey*. Craig Breidden ! Montgomeryshire.

110. *L. verruculosa*, (Borr.) *greenish-yellow*, thin, sub-determinate or effuse, *minutely areolato-rimulose, smooth, plane* or *convexo-unequal* (K yellow C red) ; *hypothallus brownish-black* ; *apothecia minute, innate and solitary in the areolæ, black*, plane or depressed, margin thin, soon obliterated ; *hypothecium dark-brown* ; *spores 8, fuscous, oblong, 1-septate*.

On maritime and mountain rocks, not unfrequent. 1811.

SYN :—E. Bot. 2317. (1811.) Hook. Br. Fl. 2. 174. Mudd Man. 215.

FIG :—E. Bot. 2317.

EXS :—Leight. 189. Zw. 26. 135. 425. Anzi Langob. 196. Mudd 186.

GEOG. DISTRIB :—Germany, Lombardy.

BOT. PROV :—1...7...10, 11...15...19.

ENGLAND :—Muggleswick Fell, West Durham. *Mr. Winch*. (1811.) Lynmouth. *Miss Atwood*. Lanbraugh Rigg ! Carlton Bank ! Cleveland. *Mr. Mudd*.

SCOTLAND :—Craig Tulloch. *Rev. J. M. Crombie.*

IRELAND :—Dunkerron ! *Dr. Taylor.* Hill near Cork ! Black-water Bridge and Lough Caragh co. Kerry. *Mr. Carroll.*

WALES :—Barmouth !

Var. *proponens*, Nyl. yellow, areolato-verruculose, or slightly granulato-verruculose (K yellow C red) ; *apothecia* sub-innate, not margined by thallus, rugulose, immarginate ; spores as above.

On maritime rocks, rare. 1868.

Merely a state of *L. verruculosa* not worth distinguishing.

SYN :—Nyl. in Flora 1868. p. 347. Crombie Enum. 94.

GEOG. DISTRIB :—Europe.

BOT. PROV :—15.

SCOTLAND :—Portlethen ! Kineardine. *Rev. J. M. Crombie.*

111. *L. stellulata*, Tayl. white or albo-cinereous, thin, sub-orbiculari-determinate, minutely areolato-rimulose, plane, smooth, (K yellow C—) ; hypothallus thin, black ; *apothecia* minute, numerous, crowded and confluent, sub-innate, black, plane, margin thin, entire ; *hypothecium* brownish-black ; spores 8, fuscous, oblong, 1-septate, small.

On maritime rocks and stones, frequent. 1836.

SYN :—Tayl. Fl. Hib. 2. 118. (1836.) Mudd Man. 216.

EXS :—Leight. 276. Zw. 402. Larbal. 38.

GEOG. DISTRIB :—Germany, Switzerland, Falkland Islands.

BOT. PROV :—1, 2, 5...7...12...19...24...30, 31.

ENGLAND :—Lynmouth. *Miss Atwood.* near Torquay ! *Dr. Deakin.* Carlisle ! *Mr. Hysham.* near Brighton ! Ventnor, Isle of Wight ; S. Devon and Cornwall. *Dr. Holl.* Plymouth. *Mr. Holmes.* Haughmond Hill ! Shropshire.

IRELAND :—Carig Mountain ! *Dr. Taylor.* Ardglass co. Down. *Dr. Maingay.* near Cork ; Carrigogunnel near Limerick. *Mr. Carroll.*

WALES :—Aberdovey ! *Rev. A. Blacum.* Barmouth ! Moel-y-Golfa ! Montgomeryshire ; Borth ! Cardiganshire ; Dolgelley ! Crib Goch ! Snowdon.

CH ANNEL ISLANDS :—Portelet Bay ! La Moye ! Jersey ; Guernsey. *Mr. Larbalestier.*

112. *L. scabrosa*, Ach. citrine or flavo-virescent, thin, areolate or areolato-granulose (K yellow C—) ; *apothecia* small, scattered, black, opaque, somewhat convex, concolorous within ; *hypothecium* black ; spores 8, fuscous, ellipsoid, 1-septate, small.

On the earth and on thallus of *Bæomyces rufus*. in

mountainous regions, rare. 1808.

SYN:—Ach. Meth. 48. (1803.) Syn 25. Nyl. Scand. 247. Flotow  
uber. Lec. scabrosa, &c. 74.

FIG:—E. Bot. 1878. Flot. l. c. 74. Hepp Sporen t. 63. f. 548

EXS:—Hepp 548. Anzi Ven. 72. Zw. 204. Arn. 97.

GEOG. DISTRIB:—Bavaria, Italy.

BOT. PROV:—2...15...19.

ENGLAND:—Sussex. *Mr. Borrer*. (1808).

SCOTLAND:—Morrene. *Rev. J. M. Crombie*. Ben Lawers. *Dr.*  
*Holl*.

IRELAND:—Bantry. *Miss Hutchins*.

113. *L. disciformis*, Fr. pale yellowish-white, very thin, smooth, continuous or unequal or rimuloso-areolate, determinate (*K* yellow *C*—); apothecia numerous, scattered, moderate, plane, marginate, black; hypothecium black; spores 8, fuscous, lineari-oblong, 1-septate.

On trees, frequent.

SYN:—Fr. in Moug. St. Vosg. 745. Nyl. in Bot. Notis. 1852. p. 175. Scand. 236. in part.

FIG:—Nyl. Bot. Notis. 1852. f. 1.

EXS:—Fellm. 200. Maudon Mad. 1865. Mass. 268. A. B. Anzi 294. 295. Schar. 197. 199. M. & N. 745. in part. Mudd. 187. 188. Zw. 349.

GEOG. DISTRIB:—E. Lapland, Italy, Switzerland, Germany, Madeira, Arctic America.

BOT. PROV:—2, 3.. 5...7...10...12...15...19...31.

ENGLAND:—Chelmsford! *Mr. Piggott*. Teeside! *Mrs. Stanger*. Kildale! Newton Wood! Sowerdale! *Mr. Mudd*. Llandforda! Shropshire. *Rev. T. Salway*. New Forest. *Rev. J. M. Crombie*. Nesscliffe Hill! Shropshire.

SCOTLAND:—Bauchory; near Aberdeen; Braemar; Callander; Blair Athole. *Rev. J. M. Crombie*. Killin! Breadalbane; Birks of Aberfeldy! *Dr. Holl*.

IRELAND:—Askew Wood! co. Kerry. *Dr. Taylor*. Castlebernard! *Mr. Carroll*.

WALES:—Garth! near Dolgelley. *Dr. Holl*. Benarth! Conway; Dolgelley!; Barmouth!

CHANNEL ISLANDS:—La Coupe! Noirmont; St. Peter's! Jersey. *Mr. Larbalestier*.

114. *L. atroalba*, Ach. griseo-pallescent or cinereo-fuscescent, tartareous, areolato-diffracto-granulose, areola plano convex (*K* brownish *C* brownish); apothecia plane, appressed, margin thickish, flexuose, black; hypothecium black or nigro-fuscous; spores 8, fuscous, oblong or oblongo-ellipsoid, 1-septate, large.

On maritime quartzose and schistose rocks, frequent.

*L. spuria*, Schar. is similar externally, but differs in the colourless hypothecium, smaller spores and chemical reaction K yellow C red, and also from *L. atroalba* which has reaction K yellow then red.

SYN :—Ach. Prodr. 63. (1798.) Syn. 11. Nyl. Scand. 232. (excl. syn).

EXS :—Fr. L. S. 382. (fide Nyl.) Fellm. Lapp. 194.

GEOG. DISTRIB :—E. Lapland, Pyrenees.

BOT. PROV :—15...19...31.

SCOTLAND :—Kincardine! *Rev. J. M. Crombie*.

IRELAND :—On maritime rocks, frequent. *Mr. Carroll*.

CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier*.

115. *L. badioatra*, Flk. *fuscous* or *fusco-griseous*, tartarcous, *areolato-diffract*, *rimulose*, *areolæ plano-convex*, scattered or *concreescent*, (*K brownish C tawny-yellow*); *apothecia sub-innate*, appressed, plane, black, margin thin, entire or flexuose; *hypothecium black*; *spores 8*, fuscous, oblongo-ellipsoid, 1-septate, *large*.

On alpine schistose rocks, rare.

Distinct from *L. atroalba* by the different reaction.

SYN :—Flk. in Sprengel N. Entdeck 2. 95, (1821.) Schar. Enum. 111. Nyl. Scand. 233.

FIG :—Hepp Sporen t. 5. f. 32.

EXS :—Schar. 179 Anzi Langob. 191. Anzi It. S. 291. Hepp 753. 32.

GEOG. DISTRIB :—Switzerland, Austria, Norway.

BOT. PROV :—15...23.

SCOTLAND :—Loch-na-Cat, Ben Lawers! *Rev. J. M. Crombie*.

IRELAND :—Killarney. *Adm. Jones*.

116. *L. coniops*, (Whlbg.) *cinereo-ferruginous*, thickish, *verruculoso-granulate*, unequal, *granules minute*, *crenate*, at length conglomerate (K—C—); *hypothallus nigricant*, radiant; *apothecia minute*, *adnate*, *black*, naked, margin thin, elevated, entire; *hypothecium nigricanti-fuscescent*; *spores 8*, fuligineo-fuscous, ellipsoid, obtuse at the apices, slightly constricted in the middle, moderate.

On maritime rocks, rare. 1870.

SYN :—Whlbg. in Ach. Meth. Suppl. 8. (1803.) Ach. Syn. 20. Nyl. Scand. 237.

EXS :—Th. M. Fries 69.

GEOG. DISTRIB :—Norway.

BOT. PROV :—15.

SCOTLAND :—Nigg and Portlethen, Kincardine! *Rev. J. M. Crombie*.



117. *L. myriocarpa*, (DC.) *cinerascent*, thin, *unequal*, or *sub-granulose*, *effuse* or *evanescent* (K—C—); *apothecia* *small*, plane or sub-convex, black, margined; *hypothecium* *nigro-fuscous*; *spores* 8, fuscous, oblong, 1-septate, *small*.

On trees and old wood, frequent.

SYN:—D.C. Fl Franc. 2. p. 346. (1805.) Ach. Syn. 18. Nyl. Scand. 237.

FIG:—Hepp Sporen t. 6. f. 41.

EXS:—Zw. 127. 194. Schar. 198. 200. Fellm. 199. 197. 198. Hepp 41. 42. 150. Mass. 264. 265. 528. 447. Rabh. 832. 729. Anzi It. Sup. 296. 298. 300. 299. 301. Nyl. 61. Bohl. 124. Mudd 189. 190. M. & N. 1328. 81. Fries 353. Spruce Amaz. 214. Leight. 63. 181.

GEOG. DISTRIB:—Italy, Sweden, Germany, Hungary, Switzerland, France, E. Lapland, Arctic America, South America.

BOT. PROV:—2, 3...5...8...10...15...19...24...31.

ENGLAND:—Ingleby! Cliffrigg! near Stokesley! Cleveland. *Mr. Mudd*. Sussex! *Mr. Borrer*. Twyercross! Leicestershire. *Rev. A. Bloram*. Hale's End near St. Leonard's, Sussex; Malvern. *Dr. Holl*. (Cleve) near Exeter. *Mr. Parfitt*. Kelvedon, Essex. *Mr. Varenne*. New Forest; Epping Forest; Finchley. *Rev. J. M. Crombie*. Plymouth. *Mr. Holmes*. Church Stretton! Bomere Pool! Loppington! Copthorn! near Shrewsbury; Wenlock Priory! Llanynynech Hill! Shropshire.

SCOTLAND:—Aberfeldy; Loch Lomond; Callander; Blair Athole; Coast of Kincardineshire. (*saxicole*) *Rev. J. M. Crombie*.

IRELAND:—Blarney! co. Cork; Kilkee, Clare. *Mr. Carroll*.

CHANNEL ISLANDS:—Jersey; Guernsey. *Mr. Larbalestier*.

118. *L. nigrītula*, Nyl. *cinerascent*, *minutely granulose* or *pulvereo-granulose*, thin, *indeterminate* or *evanescent* (K—C—); *apothecia* *minute*, opaque, plane or sub-convex, black, margin thin, soon obliterated; *hypothecium* *fuscous-black*; *spores* 8, fuscous, ellipsoid or oblong, 1-septate, *minute*.

On trees, oak, pine, and wood, rare. 1861.

SYN:—Nyl. in Bot. Notis. 1853. p. 99. Scand. 238. Mudd Man. 217.

FIG:—Hepp Sporen t. 6. f. 43.

EXS:—Nyl. 62. Zw. 126. Hepp 43.

GEOG. DISTRIB:—Paris, Germany, Switzerland.

BOT. PROV:—2...10.

ENGLAND:—New Forest, Hants. *Adm. Jones*. Farndale, Cleveland. *Mr. Mudd*. (1861).

119. *L. coracina*, Ach. *nigricant* or *cinereo-nigricant*, *areolato-rimoso-diffract*, *areolæ* *small*, plane or convex, *smooth* (K yellow then red); *hypothallus* *very black*:

*apothecia produced from the hypothallus*, small, very black, plane or convex, margin thin, entire; *hypothecium thick, black*; *thalamium pellucid*; spores 8, *fusco-nigricant*, ellipsoid, 1-septate; *gelatina hymenea* intense blue with iodine.

On alpine rocks, rare. 1808.

SYN:—Ach. Syn. 11. pro. p. (1817.) Smmr. Lapp. 142. Nyl. Scand. 232. *L. atrata*, Sm.-E. Bot. 2335.

FIG:—E, Bot. 2335.

EXS:—M. & N. 462 Fellm. 193.

GEOG. DISTRIB:—Norway, Lapland.

BOT. PROV:—7...10...15.

ENGLAND:—Near Easeby, Cleveland. Mr. Mudd. Staveley. Mr. Martindale.

SCOTLAND:—Head of Lochlee in Glen Esk, Angus. Mr. G. Don. (1808.) Cairngorm! herb. Borrer. Morron. Adm. Jones.

WALES:—Barmouth, Rev. T. Salwey.

120. *L. sub-disciformis*, Leight. *dirty yellowish-white*, thin, *minutely areolato-rimulose*, plane, *nigro-limitate* (K *yellow then red*); apothecia scattered, sessile, plane, blackish, more or less pruinose, margin thick, entire, paler; *hypothecium black*; *hymenium* pale-brown; spores 8, fuscous, oblong, 1-septate.

On rocks, not common. 1851.

Not to be confounded with *L. saxorum*, Mass. or *L. disciformis*, Fr. which have a different chemical reaction and other characteristics.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1...7...31.

ENGLAND:—Torquay, ! Devon. Dr. Deakin. Lamorna! Cornwall. Rev. T. Salwey.

WALES:—Sychmant! near Conway; Diganwy! near Conway! Conway Mountain! Holyhead Mountain!

CHANNEL ISLANDS:—South side of Jerbourg! Mr. Larbalestier.

Var. *meiosperma*, Nyl. similar to the type, but with apothecia often cæcio-pruinose, and smaller spores. (K *yellow then red*.)

On rocks, rare. 1868.

SYN:—Nyl. in Flora 1868. p. 478. Crombie. En. 88.

GEOG. DISTRIB:—Europe.

BOT. PROV:—31.

CHANNEL ISLANDS:—Jerbourg, Guernsey; Coast of Sark; Jersey! Mr. Larbalestier.

121. *L. succedens*, Nyl. whitish, thin, granulate, unequal or sub-areolate; apothecia fuscous-black, moder-

ate, margined, colourless within ; hypothecium fuscous or rubricoso-fuscous ; spores 8, nigrescent, ellipsoid, simple or 1-septate ; paraphyses moderate, articulate, apex thickened, fuscous or fuscous ; gelatina hymeneæ caeruleo-vinosa, then vinous-red with iodine.

On alpine micaceo-schistose rocks, rare. 1866.

Compare *L. scedens* Nyl. Systematically near *L. nigrifolia*.

SYN :—Nyl. in Flora 1866. p. 372. Crombie En. 89.

GEOG. DISTRIB :—Europe.

BOT. PROV :—15.

SCOTLAND :—Ben Lawers. *Adm. Jones*. 1866.

122. *L. Hookerii*, (Borr.) white or pale-yellow, consisting of appressed or plicato-rugose squamæ, somewhat farinose, effigurate at the circumference (K faint yellow C faint yellow) ; apothecia small, black, plane ; hypothecium black ; spores 8, fuscous, ellipsoid, 1-septate.

On earth on alpine rocks, rare. 1808.

Imbedded in the thallus is a minute *Sphaeria Hookerii*, Nyl. (*Ducampia*, Mass.) with ellipsoid 3-5-septate fuscous spores ; see Leight. Ang. Lich. t. 27. f. 5.

SYN :—*Verrucaria*, Borr. in E. Bot. Suppl. 2622. f. 2. Nyl. Prodr. 139.

FIG :—E. Bot. Suppl. 2622. f. 2.

EXS :—Leight. 318. Anzi Langob. 135.

GEOG. DISTRIB :—Italy.

BOT. PROV :—15.

SCOTLAND :—Ben Lawers ! *Messrs. Hooker & Borrer*. (1808).

123. *L. præcavenda*, Nyl. thallus obscure, thin, scarcely visible ; apothecia black, plane or somewhat concave, margined, small ; hypothecium somewhat reddish-brown, above more intense in colour ; epithecium obscurely amber-brown ; spores 8, faintly blackish, elliptical, 1-septate ; paraphyses slender ; gelatina hymeneæ blue then vinous-red with iodine.

On decaying holly, very rare. 1869.

Distinct from *L. muricarpa*, DC. by the form of the paraphyses and reaction with iodine and from *L. adpressa*, Hepp by the paraphyses and colour of spores and hypothecium.

SYN :—Crombie in Seeman Journ. Bot. 7. 232. (1869.) Enum. 88.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2.

ENGLAND :—Near Lyndhurst in New Forest. *Rev. J. M. Crombie*. (1869).

\*\* *Hypotheceum* colourless.

124. *L. atroalbella*, Nyl. *griseo-pallescens* or *fusco-griseous* or *cinereo-fuscescent*, *areolato-rimoso-diffract*, *areolæ small, plane, smooth* (K yellow then red); *hypothallus nigro-fuscous*; *apothecia innate in the areolæ, plane, margined*; *hypotheceum colourless*; spores 8, *fuscous, ellipsoid, 1-septate*.

On quartzose and schistose rocks, frequent.

FIG :—Hepp Sporen t. 5. f. 31. t. 61. f. 529.

EXS :—Hepp 31. 529. Mudd. 185. Leight. 184.

GEOG. DISTRIB :—Germany, Pyrenees.

BOT. PROV :—5...10...19.

ENGLAND :—Near Easby! Battersby Bank! Lanbraugh Rigg! Cleveland. Mr. Mudd. Haughmond Hill! Lyth Hill! Bodbury Ring! near Church Stretton, Shropshire.

IRELAND :—Kilcurry! near Cork. Mr. Carroll.

125. *L. alociza*, Mass. *cinereo-albescent*, *tartareo-pulverulent*, almost *evanescent* (K—C—); *apothecia scattered, at first punctiform, immersed, then emersoadnate, plane, fuscous-black, when moistened paler badio-fuscous, margin paler*; *hypotheceum colourless*; spores 8, *fuscous, rotundo-oblong, 1-septate*.

On calcareous rocks, rare. 1868.

SYN :—Mass. ! Symm. 42.

EXS :—Ain. 263. Anzi Ven. 66.

GEOG. DISTRIB :—Italy, Bavaria.

BOT. PROV :—8.

ENGLAND :—Buxton! Derbyshire. Dr. Holl. (1868.)

126. *L. leuoclinella*, Nyl. *white, cream-coloured* or *cinereous*, *tartareous, diffracto-areolato-verrucose* (K yellow C red); *apothecia appressed to the areolæ, or subinnato-sessile, black, plane, sub-immarginate*; *hypotheceum colourless*; spores 8, *fuscous, oblong, 1-septate*.

On quartzose and schistose rocks, not common.

SYN :—Nyl. in litt. 1870.

EXS :—Leight. 217.

GEOG. DISTRIB :—Italy.

BOT. PROV :—2...5 . 7.

ENGLAND :—Shanklin! Isle of Wight. Rev. T. Salvey. Lyth Hill! Shropshire.

WALES :—Diganwy! near Conway.

C. Spores 1-septate, colourless.

\* *Hypotheceum* dark.

127. *L. grossa*, Pers. *cinerascent* or *cinereo-virescent*

or *cinereo-albicant*, thin, continuous or rimose, unequal, indeterminate (K—C—); *apothecia large*, scattered, *sessile*, plane, *black*, *disk minutely papillate*, *margin thickish*, more or less flexuose and *polished*; *hypothecium black*; *spores 8*, colourless, oblong or ellipsoid, 1-septate, *very large*.

On trees, not uncommon.

SYN:—Persoon in Herb. Mougeot fide Nyl. Prodr. 139. Nyl. Scand. 239. *Lecidea premnea*, Fr. L. S. Exs. 26. *Lecidea leucoplaea*, Chev. Fl. Paris. 1. 572.

FIG:—Hepp Sporen t. 73. f. 647.

EXS:—Fries L. S. 26. fide Nyl. Hepp 647. Mudd 147. Leight. 125. Rabh. 869. Zw. 423.

GEOG. DISTRIB:—Europe, Sweden, France, Germany, America, Australia.

BOT. PROV:—1, 2, 3 .5...7...10, 11...13...15...19, 20...24 .. 26...30, 31.

ENGLAND:—Airyholme Wood! Kildale! Cleveland. *Mr. Mudd*. Torquay! Devon. *Dr. Deakin*. The Lodge! near Ludlow, Shropshire. *Rev. T. Salwey*. Sussex! *Mr. Borrer*. Durham! *Rev. J. Harriman*. near Malvern; near Newton Bushell; near Shanklin. *Dr. Holl*. Stoke Wood, Exeter. *Mr. Parfitt*. Rivenhall, Essex. *Mr. Varenne*. New Forest. *Rev. J. M. Crombie*. Abdon! Shropshire.

SCOTLAND:—Invercauld! Braemar. *Dr. Lindsay*. Glencoe! *Mr. Borrer*. Crummach! Ayrshire. *Mrs. Dobie*. Kenmore, Perthshire. *Dr. Holl*. Braemar; Killin. *Rev. J. M. Crombie*.

IRELAND:—Derriquin! co. Kerry. *Dr. Taylor*. Blarney, Cork; Killarney, Kerry; and Dromoland, Clare; Loughcooter, Galway. *Mr. Carroll*. near Belfast. *Mr. Templeton*. Castletaylor, Galway. *Dr. Moore*. Curraghmore, Waterford. *Adm. Jones*.

WALES:—Hendreforion! near Barmouth. *Rev. T. Salwey*.

CHANNEL ISLANDS:—Rozel, Jersey. *Mr. Larbalestier*.

128. *L. lutosa*, (Mont.) *dirty-ochraceous*, tartareous, *rimoso-areolate*, *areolæ plane*, sometimes lobulate, (K—C—); *apothecia black within and without*, at first innate and immarginate, then appressed, *plane*, margin thin, prominent, entire; *hypothecium black*; *spores 8*, colourless, *oblong*, 1-septate, small.

On mountain rocks, rare.

SYN:—Montagne M.S. in Schær. En. 116. (1850).

FIG:—Hepp Sporen t. 59. f. 506.

EXS:—Schær. 579. Zw. 348. Anzi Langob. 360.

GEOG. DISTRIB:—Pyrenees, Germany, Switzerland, Hungary, Lombardy.

BOT. PROV:—1...5...7...10.

ENGLAND:—Thirsk, Yorkshire. *Mr. Baker*. Starcross! Devon-



shire ! *Mr. Parfitt*. Llanymynech Hill ! Shropshire.

WALES :—Cader Idris ! north-west.

129. *L. chalybeia*, Borr. leaden-black, thin, slightly tartareous, minutely cracked (K—C—); apothecia minute, superficial, scattered, black, plane, margin entire, slightly elevated; *hypothecium nigro-fuscous*, thickish; spores 8, colourless, linear-oblong, 1-septate, small.

On rocks, tiles, flints, &c., not uncommon. 1831.

SYN :—Borr. in E. Bot. Suppl. 2687. Nyl. Prodr. 136.

FIG :—E. Bot. Suppl. 2687. f. 2. Hepp Sporen t. 4. f. 13. & t. 58. f. 498.

EXS :—Nyl. 139. Hepp 13, 498. Anzi Langob. 448.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1, 2...5...7...10...19...31.

ENGLAND :—Sussex ! *Mr. Borrer*. (1831.) Ayton ! Cleveland ; near Rievaulx, Bilsdale, Yorkshire. *Mr. Mudd*. near Brighton ; Laneast Down, Cornwall. *Dr. Holl*. Wickin ! Pontesford Hill ! Haughmond Hill ! Shropshire.

SCOTLAND :—Ben Lawers and Craig Guie. *Rev. J. M. Crombie*.

IRELAND :—Dunkerron ! *Dr. Taylor*. Whitepoint ! near Cork ; Blackwater ; Blackstone Bridge ; *Mr. Carroll*.

WALES :—Abergwynant ! Dolgelley. *Dr. Holl*.

CHANNEL ISLANDS :—Bonne Nuit ; Rozel Valley ! Jersey. *Mr. L'arbalastier*.

130. *L. contristans*, Nyl. fuscous or fusco-nigricant, thin, granulose; apothecia black, somewhat convex, im-marginate, dusky within; spores 8, colourless, ellipsoid, or oblong, 1-septate; paraphyses indistinct; epithecium nigricant; *hypothecium dusky*; gelatina hymenaea caerule-scent, then dusky yellow with iodine.

On mosses in alpine localities, rare. 1864.

Systematically near *L. melana*, Nyl.

SYN :—Nyl. in Flora 1865. p. 354. Crombie En, 72.

GEOG. DISTRIB :—Europe.

BOT. PROV :—15.

SCOTLAND :—Near summit of Ben Lawers. *Mr. Carroll*. (1864).

131. *L. Templetoni*, Tayl. greyish-white, thin, effuse, granulose (K—C—); apothecia moderate, more or less crowded, sessile, black, slightly polished, plane, with a thin entire or flexuose margin; *hypothecium* thick, brownish-black; spores 8, colourless, oblong or obtusely fusiform-oblong, 1-septate.

On mosses, rare. 1836.

SYN :—Tayl. Fl. Hib. 2. 123. (1836.) Mudd Man. 189.

GEOG. DISTRIB :—Europe.

**BOT. PROV :—**5 .11...15...19...29, 30.

**ENG. AND W. —**O westry ! Shropshire. *Rev. T. Salway*. Teesdale ! *Rev. J. Harriman*.

**SCOTLAND :—**Ben Lawers. *Adm. Jones*.

**IRELAND :—**Near Belfast ! *Mr. Templeton*. near Bantry. *Miss Hutchins*. North of Ireland. *Adm. Jones*. Lisburn. *Dr. Dickie*.

132. *L. cordata*, (Web.) *white*, squamulose, squamæ swollen, lobato-plicate, congested and imbricate in the centre, lobed at the circumference, densely albo-granulato-tuberculate, (K—C—) ; apothecia appressed, black, casio-pruinose, plane or somewhat convex, margin thickish, entire, flexuose ; hypothecium reddish brown ; spores 8, colourless, fusiform, obtuse, 1-septate.

On the earth among alpine rocks, rare.

A section of the apothecium shows the hymenium to rest on a pale reddish brown dark hypothecium, which is subtended by a horny striated pericarpium, externally marked with a thin dark brown line. By this and the different chemical reaction at all times distinguishable from *L. vesicularis*.

**SYN :—**Weber Spicil. 193. (1778.) Ach. Syn. 50. Nyl. Scand. 215.

**FIG :—**Hoffm. Pl. Lich. t. 33. f. 2. Hepp Sporen t. 15. f. 124.

**EXS :—**Hepp 124. Zw. 347. Anzi It. S. 244. Bohl. 67. M. & N. 642. Mass. 308.

**CLAS. DESCRIB :—**Europe, Germany, Switzerland, Italy, Pyrenees, Hungary, Africa, America.

**BOT. PROV :—**7.. 15.

**SCOTLAND :—**Ben Lawers. *Adm. Jones & Crombie*.

**WALES :—**Great Orme's Head ! Carnarvonshire.

133. *L. vesicularis*, (Hffm.) *glaucescens* or *caeruleo-nigricans* or *pallido-olivaceo-fuscescent*, squamulose, squamæ bullate or bullato-plicate in the centre, rotundato-lobate at the circumference, smooth, casio-pruinose, (K dirty brown) ; apothecia elevated, sessile, bluish black, naked or casio-pruinose, plane, margin thick, obtuse, entire or flexuose ; hypothecium nigro-fuscous ; spores 8, colourless, fusiform, acute, 1-septate.

On the earth among maritime calcareous rocks, frequent. 1772.

A section of the apothecium shows the hymenium to rest on a reddish brown hypothecium, subtended by a pale mass, with an external reddish brown pericarpium.

**SYN :—**Hffm. Pl. Lich. 2. 30. (1794.) Ach. Syn. 51. Nyl. Scand. 214.

**FIG :—**Hffm. Pl. Lich. t. 32. f. 3. E. Bot. 1139.

Exs :—Anzi It. S. 241. (in part) 242. Larbal. 34. Mass. 274. 275. Mudd 143. M. & N. 172. Schær. 168.

GEOG. DISTRIB :—Portugal, Algeria, Germany, Switzerland, Italy, France, Pyrenees, Austria, Hungary, Sweden, Arctic America, Cape Horn, Asia.

BOT. PROV :—1, 2...4, 5...7, 8...10, 11, 12...15...19...23...29, 30, 31.

ENGLAND :—Near Buxton ; near Torquay ; Ventnor, Isle of Wight. *Dr. Holl.* Westleigh ! Devon. *Mr. Parfitt.* Cambridgeshire. *Rev. Mr. Hemsted.* Teesdale, Durham. *Rev. J. Harriman.* Westmoreland. *Mr. Brunton.* near Bristol. *Miss Atwood.* Gogmagog Hills, Cambridgeshire. *Mr. Hailstone.* Malham. *Dr. Currington.* near Babbicombe. *Adm. Jones.* Hurstpierpoint. *Mr. Hemmings.* Oswestry ! Shropshire. *Rev. T. Salwey.* Bray Hill, St. Minver near Padstow ! *Rev. R. V. Tellam.*

SCOTLAND :—Highlands. *Rev. J. Lightfoot.* (1772.) Ben Lawers. *Dr. Holl.* Craig Guie ! Appin ! Craig Tulloch. *Rev. J. M. Crombie.*

IRELAND :—North Wall, Dublin. *Mr. Brown.* near Baldoyle. *Dr. Taylor.* near Cork and Middleton. *Mr. Carroll.* North of Ireland. *Dr. Moore.*

WALES :—Puffin Island, Anglesea. *Rev. A. Bloxam.* Great Orme's Head !

CHANNEL ISLANDS :—Queenvais ! Jersey ! Cobo, Guernsey. *Mr. Larbalestier.*

134. *L. colludens*, Nyl. *griseo-pallescent*, thin, *disperso-areolate*, areolæ plano-convex, depressed, (K brownish C brownish) ; *hypothallus nigricant predominating* ; apothecia black, plane, innato-sessile, margin thick ; hypothecium black ; spores 8, colourless, oblong, 1-septate.

On quartzose and schistose rocks, not common. 1856.

SYN :—*L. atroalba* var. *chlorospora*, Nyl. Lich. Holm. 1. in Bot. Notis. 1853. p. 6. Scand. 233.

GEOG. DISTRIB :—Scandinavia.

BOT. PROV :—7...15.

SCOTLAND :—Killin ! Breadalbane. *Rev. J. M. Crombie.* Ben Lawers ! *Dr. Stirton.*

WALES :—Barmouth ! Cwm Glas ! Snowdon ; Llyn Cae ! Cader Idris.

135. *L. intermixta*, Nyl. *whitish*, very thin, smooth, effuse or evanescent, (K yellow C—) ; *apothecia violet-black*, moderate, numerous, solitary or confluent, plane or plano-convex, margin thin, soon obliterated, internally dusky ; *epithecium violet black* ; *hypothecium red-dish-violet-black* ; paraphyses crowded, distinct, stout ; spores 8, colourless, oblong or ellipsoid, 1-septate.

On trees, rare. 1869.

SYN:—Nyl. Addit. Chilens. 161. (1855.) Scand. 194. Crombie En. 64. *Biatorina arcutica*, Körb. S. L. G. 192.

EXS:—Hepp 279. Zw. 343. Arn. 76.

GEOG. DISTRIB:—Sweden, Switzerland, Germany, France.

BOT. PROV:—2...31.

ENGLAND:—New Forest! near Lyndhurst and Ringwood, Hants. *Rev. J. M. Crombie*. (1869.) Hurstpierpoint, Sussex! and near Tunbridge Wells! *Mr. Borrer*.

CHANNEL ISLANDS:—St. Peter's Valley, Jersey. *Mr. Lurbaletier*.

136. *L. anomaloides*, Nyl. *whitish*, thin, *granulose* or *evanescent*; *apothecia fusco-nigricant* or *fusco-pallescent* or *black*, small, sub-convex, immarginate; *hypothecium fuscous black*; *spores* 8, colourless, oblong, 1-septate

On schistose earth in mountainous districts, rare. 1860.

SYN:—Nyl in Flora 1862. p. 464. Crombie En. 70.

GEOG. DISTRIB:—France.

BOT. PROV:—15.

SCOTLAND:—(forma *denigrans*, Nyl. in litt.) Ben Lawers. *Adm. Jones*. (1860).

137. *L. Muddii*, Salw. MS. *olive-green*, cartilagineo-tartareous, smooth, *sub-colliculoso-areolate*, sub-determinate; *apothecia pale-brown* or *reddish-brown*, minute, numerous, scattered, innato-sessile, plane, margin very thin, smooth, eventually evanescent; *hypothecium thin, pale-brown*; *spores* 8, colourless, elliptical-oblong or ovate, 1 septate; paraphyses lax, slender.

On maritime rocks, rare. 1860.

SYN:—Salwey in litt. Mudd Man. 179. (1861).

GEOG. DISTRIB:—Europe.

BOT. PROV:—1.

ENGLAND:—Near Newlyn, Cornwall. *Rev. T. Salwey*. (1860).

138. *L. alpicola*, (Schær.) like *L. geographica* but with *spores colourless*, 1-septate.

On alpine whinstone rocks, very rare. 1869.

SYN:—*L. geographica* var. *alpicola* Schær. Spic. 124. (1833.) Nyl. Prodr. 143. Crombie in Seem. Journ. Bot. 8. 99.

EXS:—Schær. 173. Hepp 151.

GEOG. DISTRIB:—Switzerland, France, Pyrenees, Sweden, Asia.

BOT. PROV:—15.

SCOTLAND:—Summit of Ben Nevis. *Rev. J. M. Crombie*. (1869).

\*\* *Hypothecium colourless*.

139. *L. lenticularis*, Ach. *brownish* or *nigricant* or

*cinereo-fuscescent, thin, indeterminate or evanescent, (K—C—); apothecia black or fuscous-black, small, plane, marginate; hypothecium colourless; spores 8, colourless, oblong or lineari-oblong, 1-septate, small.*

On mountain and maritime rocks, not unfrequent.

SYN:—Ach. Syn. 28. (1814.) Nyl. Scand. 242.

EXS:—Zw. 272. Anzi Ven. 68. Ital. S. 254. Langob. 120.

GEOG. DISTRIB:—Switzerland, Germany, Italy, N. Africa.

BOT. PROV:—7...(19—30).. 31.

IRELAND:—Common. *Mr. Carroll.*

WALES:—Nant-Gwynant! Snowdon! Holyhead Mountain!

CHANNEL ISLANDS:—Jersey. *Mr. Larbalestier.*

A forma *minor* has been found on Turk Mountain, Killarney, according to Crombie En. 91.

Var. *chloropolita*, Nyl. *cinereo-virescent*, thin, unequal or rugulose; apothecia large.

On maritime rocks, not common.

SYN:—Nyl. Armor. in Bull. Soc. Bot. Fr. 8. p. 758. (1861.)

GEOG. DISTRIB:—France.

BOT. PROV:—15.. 24...31.

SCOTLAND:—Kincardine. *Rev. J. M. Crombie.*

IRELAND:—Kilkee co. Clare. *Mr. Carroll.*

CHANNEL ISLANDS:—Boulay Bay, Jersey. *Mr. Larbalestier.*

Var. *nigro-clavata*, Nyl. *evanescent*; apothecia small, superficial, convex or plane, internally cinerascens in the middle; spores 8, pale yellow, oblongo-cylindrical, simple.

On trees.

SYN:—Nyl. in Bot. Not. 1853. p. 160. Scand. 242. Crombie Enum. 91.

GEOG. DISTRIB:—France, Germany, Russia, Algeria.

BOT. PROV:—2.. 24.

ENGLAND:—Shanklin, Isle of Wight. *Dr. Holl.*

IRELAND:—Rostellan co. Cork; near Limerick. *Mr. Carroll.*

140. *L. sub-nigrata*, Nyl. *cinereo-nigricant, furfuraceo-diffract, granulose, (K—C—); apothecia fuscous-black, convex, immarginate, generally conglomerate; hypothecium colourless; spores 8, colourless, ellipsoid, 1-septate, small; paraphyses indistinct.*

On alpine rocks, rare. 1866.

“Vix separanda a *L. denigrata*,” Nyl.

SYN:—Nyl. in Flora 1866. p. 370.

GEOG. DISTRIB:—Europe.

BOT. PROV:—5...7...11...15.



ENGLAND :—Force Garth, Teesdale. *Dr. Holl.* Abdon Burf ! Shropshire.

SCOTLAND :—Ben Lawers ; Crainlarick. *Dr. Holl.*

WALES :—North side of Cader Idris ! (1866).

141. *L. pinati*, (Schräd.) *virescent*, *leprose*, very thin, or evanescent, (K — C —) ; *apothecia* *pale rufous-yellow* or *whitish flesh-colour*, *minute*, numerous, scattered, *concave*, almost *urceolate*, *margin paler*, smooth, thickish, *waxy* ; *hypothecium* colourless ; spores 8, colourless, elliptico-oblong, 1-septate.

On bases of pine trees, frequent. 1808.

SYN :—Schräd. in Ach. Meth. 68. (1803.) Ach. Syn. 41. Nyl. Scand. 191.

FIG :—E. Bot. 1863. two lower fig.

EXS :—Zw. 83. Mudd. 145. Hepp 136. Nyl. 56. Schær. 213. Leight. 89.

GEOG. DISTRIB :—Germany, Bavaria, France, Switzerland, Sweden, Finland, America.

BOT. PROV :—2...4, 5...8...10...19...22...24, 25.. 28.. 30, 31.

ENGLAND :—Cossey near Norwich. *Sir W. J. Hooker.* (1808.) Wood east end of Llanforda Pool ! Oswestry. *Rev. T. Salwey.* Twycross ! Gopsall ! Leicestershire. *Rev. A. Bloxam.* Cliffrigg ! Cleveland. *Mr. Mudd.* near Brighton, Sussex. *Mr. Lorbalestier.* Wapley Hill ! Herefordshire ; Round Hill ! near Shrewsbury.

IRELAND :—Near Larn and Belfair. *Dr. Moore.* Armagh. *Adm. Jones.* near Cork ; near Limerick co. Clare ; Baltinglass, Wicklow ; Glenville, Cork ; Glenstalk, Tipperary. *Mr. Carroll.*

CHANNEL ISLANDS :—Rozel, Jersey. *Mr. Lorbalestier.*

142. *L. lutea*, (Dicks.) *albescent*, effuse, very thin, granuloso-leprose, or evanescent, (K — C —) ; *apothecia* *bright carnea*, *intrescent*, rather large, scattered, more or less *concave*, then *plano-concave*, margin entire, thin, smooth, *paler*, flexuose ; *hypothecium* *thick*, colourless, *carnose* ; spores 8, colourless, *fusiformi-oblong*, 1-septate.

On trees, not common. 1785.

SYN :—Dicks. Br. Crypt. 1. 11. (1785.) Nyl. Scand. 192.

FIG :—E. Bot. 1263. Leight. Br. Ang. Lich. t. 14. f. 3.

EXS :—Hepp 501. Larbal. 29. Zw. 331. Wright Cuba. 177. Korb. 277. Arn. 98.

GEOG. DISTRIB :—France, Germany, Austria, Bavaria, Cuba, Ceylon, Lapland, Norway, America, Sandwich Islands.

BOT. PROV :—1, 2.. 5.. 7 ..19 ..28...30, 31.

ENGLAND :—*Mr. Dickson.* (1785.) Penzance ! Hartwood near Oswestry. *Rev. T. Salwey.* Woodmancote ! Sussex. *Mr. Borrer.* Launceston ; near Lyndhurst, New Forest. *Rev. J. M. Crombie.* Farley, Sussex. *Mr. Lorbalestier.* Ditcham Cross, S.

Devon ; Camelford, Cornwall. *Dr. Holl.* Countess Weir Topsham, Devon. *Mr. Parfitt.* Lydford, Devon. *Mr. Holmes.*

IRELAND :—Ardrum ! Castlemary ! near Cork. *Mr. Carroll.* Killarney. *Mr. Hardy.* Luggelaw and Glengarriff. *Adm. Jones.* near Bantry. *Miss Hatchins.* near Belfast. *Mr. Templeton.* Askew Wood and Dunkerron. *Dr. Taylor.* Glenarm. *Dr. Moore.*

WALES :—Near Bangor. *Mr. Turner.*

CHANNEL ISLANDS :—Quenvais ; Rozel ! Jersey. *Mr. Larchestier.*

143. *L. cyrtella*, Ach. *pale* or *whitish* or *cream-coloured*, very thin, unequal or evanescent, (K—C—) ; *apothecia pale* or *livido-rufescent* or *rufescent*, plane or convex, small, *generally with more or less of a pseudo-thalline white margin* ; *hypothecium* colourless ; spores 8, colourless, linear-oblong, 1-septate, rather large.

On trees, not unfrequent. 1810.

The apothecia when moistened with K and subsequently with C become pale and transparent in the disk with a very thin greenish line around the circumference.

SYN :—Ach. Meth. 67. (1805) Syn. 39. Nyl. Scand. 206.

FIG :—E. Bot. 2155.

EXS :—Schar. 473. Arn. 48. Anzi Langob. 336. Rabh. 174. Hepp 18. Fellm. 161. Zw. 275. Mass. 132.

GEOG. DISTRIB :—Switzerland, Bavaria, Lombardy, Hungary, Germany, Italy, E. Lapland.

BOT. PROV :—2...4... 8... 10... 24...31.

ENGLAND :—Yarmouth. *Mr. Turner.* 1810. Sussex ! *Mr. Borrer.* Airyholme Wood ! Kildale ! Cleveland. *Mr. Mudd.* Gopsall ! Leicestershire. *Rev. A. Bloxam.*

IRELAND :—Ballynagarda ; Mountshannon, Limerick. *Mr. Carroll.*

CHANNEL ISLANDS :—(*saxicole*) Ann Port, Jersey. *Mr. Larchestier.*

144. *L. anomala*, (Fr.) *albo-cinerascent*, *sub-granuloso-pulverulent*, thin, sometimes evanescent, (K—C—) ; *apothecia livido-rufous* or *blackish*, *adnate*, plane, margin thin, at length convex and margin obliterated ; *hypothecium* colourless ; spores 8, colourless, oblong or elliptical, 1-septate, large.

On trees, not common.

Form and size of spores, distinguish it from *L. tricolor* and *L. globulosa*.

SYN :—Fries L. Eur. 269. (1831.)

EXS :—Fries L. Succ. 350. Mudd 155.

GEOG. DISTRIB :—Scandinavia.

BOT. PROV :—3...10.

ENGLAND:—Near Ayton; Airyholme! Cleveland. *Mr. Mudd*. Hickmore, Fen Wood; Mile End near Colchester; Felix Hall Park; Kelvedon; Pod's Wood, Messing, Essex. *Mr. Varenne*.

145. *L. Lightfootii*, (Sm.) *greenish-white, tartareous, effuse, granuloso-verrucose, (K—C—)*; *apothecia sub-innato-sessile, plane, polished, black, margin thin, smooth, paler, flexuose*; *hypotheceum pale*; spores 8, colourless, linear-oblong, 1-septate, *cells rounded and slightly dilated at the apices, small*.

On trees, rare. 1784.

SYN:—Sm. E. Bot. 1451. (1805.) Ach. Syn. 34. Nyl. Prod. 105.

FIG:—E. Bot. 1451. Hepp Sporen t. 58. fig. 503.

EXS:—Hepp 503. Schær. 581. (in part).

GEOG. DISTRIB:—France, Germany.

BOT. PROV:—2, 3...5...13...31.

ENGLAND:—*Rev. J. Lightfoot*. (1784.) Sussex! *Mr. Borrer*. Essex. *Mr. Piggyott*. Oswestry! Shropshire. *Rev. T. Salwey*. Lyndhurst, New Forest. *Rev. J. M. Crombie*.

SCOTLAND:—Caerlaverock road! Dumfries. *Dr. Lindsay*.

CHANNEL ISLANDS:—Patrimoine, Jersey. *Mr. Larbalestier*.

*forma commutata*, (Ach.) thallus dissolved and *pulverulent*.

On trees, rare.

SYN:—Ach. L. U. 352? Mass. Ric. 136. Mudd Man. 179.

FIG:—Mass. Ric. f. 269.

EXS:—Zw. 373. Hepp 744. M. & N. 839.

GEOG. DISTRIB:—Germany.

BOT. PROV:—2..19...24...28.

ENGLAND:—Sussex! *Mr. Borrer*.

IRELAND:—Cahirlogue;! Ardum near Cork; Killaloe, Clare. *Mr. Carroll*. Armagh near the Obelisk. *Adm. Jones*.

146. *L. globulosa*, Flk. *greyish-white, thin, effuse, granuloso-leprose, (K—C—)*; *apothecia minute, numerous, scattered, adnate, black, margin thin*; *hypotheceum colourless*; spores 8, colourless, *oblongo-fusiform, 1-septate, small*.

On trees, not unfrequent.

SYN:—Flk. Dent. Lich. 181. (1821.) Nyl. Lapp. Or. 149. Crombie Enum. 69.

FIG:—Hepp Sporen t. 4. f. 16.

EXS:—Fellm. 155. Hepp 16. Anzi H. S. 258. Zw. 893.

GEOG. DISTRIB:—E. Lapland, Germany, Italy, Hungary, Switzerland.

BOT. PROV:—15..19.

SCOTLAND:—Loch Katrine; Lochaber. *Rev. J. M. Crombie.*

IRELAND:—Glencar co. Kerry. *Mr. Carroll.*

147. *L. denigrata*, Fr. *fusco nigricant*, somewhat *vi-rescent*, thin, effuse, *minutely granulose*, (K—C—); *apothecia minute, conglomerat*, sessile, livid-black, *con-  
vex*, sub-immarginate; *hypothecium colourless*; *spores 8*, colourless, *elliptico-oblong* or *ovate*, *straight* or *slightly curved*, 1-septate, *small*.

On old pales, posts, &c. not unfrequent. 1831.

SYN:—Fr. L. Eur. 270. (1831.) Nyl. Scand. 202.

FIG:—E. Bot. Suppl. 2711. Hepp Sporen t. 4. f. 14.

EXS:—Hepp 14. Anzi It. S. 256. Zw. 394.

GEOG. DISTRIB:—Switzerland, Italy, Germany, Scandinavia.

BOT. PROV:—2, 3.. 5.. 10.

ENGLAND:—Esher, Surrey; Henfield and Boxgrove, Sussex. *Mr. Borrer.* (1851.) Farndale! near Marslee, Cleveland. *Mr. Muhl.* Sherrinbury! Sussex. *Mr. Larkdalester*. near Trellach Hall! Shropshire and Penzance! *Rev. T. Salwey.* Caer Canadoc! Shropshire.

148. *L. fallax*, (Hepp.) *cinereo-virescent*, thin, *sub-leprose*, effuse; *apothecia flesh-colour-yellow*, somewhat convex or convex, *immarginate* (young apothecia with an obtuse margin), *colourless within*; *spores 8*, colourless, oblong or oblongo-fusiform, 1-septate; paraphyses slender or indistinct; *epithecium, hymenium and hypo-  
thecium colourless*; *gelatina hymenea blue*, then violet, with iodine. (K turns apothecia reddish.)

On elms, rare. 1865.

SYN:—Hepp Flecht. Europ. 505. (1860.) *L. chlorotica*, Nyl. in Flora 1866. p. 85. Crombie En. 70.

FIG:—Hepp Sporen t. 58. f. 505.

EXS:—Hepp 505. Wright Cuba 197. Schaer. 207. Zw. 277. Arn. 74.

GEOG. DISTRIB:—Germany, Switzerland, Pyrenees, Italy, Bavaria, Cuba.

BOT. PROV:—1, 2.

ENGLAND:—Leigh Woods! Clifton, co. Somerset. *Mr. Larkdalester.* (1865.) near Shanklin, Isle of Wight. *Dr. Holl.*

149. *L. Ehrhartiana*, (Ach.) *albido-flavescent*, effuse, granulato-rugose or evanescent; *apothecia pale yellow*, small, numerous, *adnate*, plane, margin thin, afterward-convex and immarginate; *hypothecium colourless*; *spore 8*, colourless, *lineari- or fusiformi-oblong*, 1-septate small. (K turns apothecia reddish.)

On exposed old timber, barns, &c., not common. 1803.

*Cliostomum corrugatum*, Fr. (Leight. Angioc. Lich. p. 69. t. 30. f. 1.) constitutes the spermogonia of this lichen.

SYN:—Ach. Prodr. 39. (1798.) Syn. 47. Nyl. Scand. 195.

FIG:—E. Bot. 1136. Leight. Angioc. Lich. t. 30. f. 2.

EXS:—Hepp 497. Zw. 91. 109. Schaer. 326. 192. Leight. 410.

GEOG. DISTRIB:—Switzerland, Germany, Sweden, Italy.

BOT. PROV:—1, 2, 3, 4, 5.

ENGLAND:—Acle, Norfolk. *Mr. Turner*. (1803.) Livermere! Suffolk; near Cotteshall! *Mr. Borrer*. Tilgate Forest, Sussex. *Mr. Larkbalestier*. Devon. *Mr. Purpitt*. Messing, Essex. *Mr. Varenne*. Great Alne, Warwickshire. *Rev. W. S. Rufford*. Cambridge. *Rev. R. Relhan*. near Colchester, Essex. *Rev. J. M. Crombie*. Pembrige! Herefordshire.

150. *L. tricolor*, (With.) *whitish*, very thin, unequal or obsolete or *sub-granuloso-rugose*, *effuse*, (*K* yellow *C* orange); *apothecia* *carneo-fuscous* or *livido-fuscescent* or *nigricant*, plane, *margin* thin, *paler*; *hypothecium* *colourless*; spores 8, colourless, oblongo-ellipsoid or *oblongo-fusiform*, 1-septate.

On oak and pine trees, common. 1796.

SYN:—With. Arr. 4. 23. (1716.) Nyl. Scand. 207. *Lichen Griffithii*, Sm. *Biatore mixta*, Fr. L. E. 268.

FIG:—E. Bot. 1735. Hepp Sporen t. 85. f. 738.

EXS:—Bohl. 119. Zw. 82. Arn. 216. Hepp 738. Korb. 278. Leight. 70.

GEOG. DISTRIB:—Sweden, Italy, Germany.

BOT. PROV:—2...4, 5...7, 8...10, 11...15...19...25...30, 31.

ENGLAND:—Durham. *Rev. J. Harriman*. Yarmouth. *Mr. Turner*. Sussex! *Mr. Borrer*. Lodge near Ludlow! Woodhill! Oswestry, Shropshire. *Rev. F. Salway*. Haughmond Hill! Shropshire. *Prof. Churchill Babington*. Cliffrigg! Oggery Hill! Airyholme Wood! Cleveland. *Mr. Mudd*. New Forest and Epping Forest. *Rev. J. M. Crombie*. Malvern; Isle of Wight. *Dr. Holl*. Stoke Wood, Exeter. *Mr. Purpitt*. near Twycross, Leicestershire. *Rev. A. Blacum*. near Colchester, Essex. *Mr. Varenne*. Ragley Wood, Warwickshire. *Rev. W. S. Rufford*. Nesseliffe Hill! Haughmond Hill! High Rock near Bridgnorth! between Hopton and Great Ness! Shropshire.

SCOTLAND:—Loch Lomond. *Rev. J. M. Crombie*. Glen Falloch. *Dr. Holl*.

IRELAND:—Near Cork and Glenstal co. Tipperary. *Mr. Carroll*. near Belfast. *Mr. Templeton*. near Dunkerron. *Dr. Taylor*.

WALES:—Garn near Denbigh. *Mr. Griffith*. (1796.)

CHANNEL ISLANDS:—St. Peter's Wood! Jersey. *Mr. Larkbalestier*.

151. *L. biformigera*, Leight. *dirty white*, thick, *tartareous*, *verrucoso-areolate*, *rimoso-diffract*, (*K* yellow *C*



yellow); *apothecia* small, black, conglomerate, plane, slightly margined; *hypothecium* colourless; *spores* 8, colourless, narrowly oblong, 1-septate, cells binucleolate.

On alpine rocks, rare. 1866.

The spores are similar in shape and size to those of *Verrucaria biformis*, Borr.

SYN:—Leight. in Ann. and Mag. Nat. Hist. 1867.

GEOG. DISTRIB:—Europe.

BOT. PROV:—7.

WALES:—North escarpment of Cader Idris! (1866.) Llyn Cae! Cader Idris; rocks near Llyn Aran! Cader Idris.

152. *L. pulverea*, Borr. pale-greyish-green, minutely granuloso-pulverulent or mealy, soft, effuse, indeterminate, moderately thick, (K yellow C—); *apothecia* rather large, scattered or conglomerate, adnato-sessile, black, internally pale, plane, with a paler livid slightly raised margin, eventually convex and immarginate; *hypothecium* colourless; *spores* 8, colourless, oblong or elliptico-oblong, 1-septate, large.

On trees, rare. 1807.

Not unlike the *commutata* form of *L. Lightfootii*, but differs in size and shape of the spores and chemical reaction.

SYN:—Borrer in E. Bot. Suppl. 2726. (1831).

FIG:—E. Bot. Suppl. 2726.

GEOG. DISTRIB:—Europe.

BOT. PROV:—2...7...12...15...19.

ENGLAND:—New Forest. Mr. Lyell. Keswick, ! Cumberland. Mrs. Stanger, near Danny, Sussex. Mr. Lerbalestier.

SCOTLAND:—Aberfeldy! Glen Falloch near Inverarnan. Dr. Holl. Loch Lomond. Rev. J. M. Crombie.

IRELAND:—Glengarriff. Adm. Jones. Old Dromore. Dr. Taylor. Cromaglow, Killarney. Dr. Moore. near Killarney. Mr. Carroll.

WALES:—Barinmouth! Rev. T. Salwey & Mr. Borrer. Glyn! near Capel Curig.

153. *L. luteella*, Nyl. white, very thin or albo-macular; *apothecia* pale-yellow, small, margined (or submarginate, young ones gyalectoid), colourless within; *spores* 8, colourless, oblong or oblongo-fusiform, 1-septate; thecae often thick and solid at the apices; paraphyses slender.

On calcareous rocks, rare. 1865.

Systematically after *L. erysiboides*, Nyl.

SYN:—Nyl. in Flora 1865. p. 6. Crombie En. 73.

GEOG. DISTRIB:—Europe.

BOT. PROV:—28.

IRELAND :—Sheepwalk, Armagh. *Adm. Jones.*

154. *L. holomeloides*, Nyl. *duky* or *nigricant*, thin, effuse, *sub-granulate*; apothecia *black*, somewhat convex, immarginate, *duky within*; spores 8, colourless, oblong or sub-bacillar, 1-septate, variable in size; paraphyses indistinct; epithecium *nigricant*; *hypothecium nearly colourless or very slightly fuscous*; gelatina hymenea slightly blue, then yellowish, with iodine.

On micaceo-schistose earth in alpine places, rare. 1866.

Approaching *L. globulosa*, Flk. but with the aspect of *L. melæna*, Nyl.

SYN :—Nyl. in Flora 1866. p. 369. Crombie En. 70.

GEOG. DISTRIB :—Europe.

BOT. PROV :—15.

SCOTLAND :—Near summit of Ben Lawers. *Adm. Jones.*

155. *L. erysiboides*, Nyl. *green, leprose*, thin, nearly indeterminate, almost evanescent, (K—C—); *apothecia testaceo-rufous*, small, sub-convex, immarginate, opaque; *hypothecium colourless*; spores 8, colourless, ovoid, apically obtuse, 1-septate; paraphyses indistinct.

On old trunks and wood in moist shady places, rare. 1870.

SYN :—Nyl. in Sällsk. pro. F. & Fl. F. Notis. 4. (n. ser. 1.) p. 232. (1859.) Scand. 208.

EXS :—Fellm. 156. Arn. 280

GEOG. DISTRIB :—Sweden.

BOT. PROV :—1, 2...15.

ENGLAND :—Devon; Isle of Wight. (1870.) (*forma sordidescens*. Nyl.) New Forest near Lyndhurst! *Rev. J. M. Crombie.*

SCOTLAND :—(*f. pallida*, Nyl.) Lake Katrine! *Rev. J. M. Crombie.*

156. *L. Bouteillei*, (Desmaz.) *albido-subvirescent, filmy*, thin, effuse, *minutely granulose*, (K—C—); *apothecia pale yellow-flesh-colour*, minute, scattered, *adnato-sessile*, plane, margin thin, paler, entire or crenato-flexuose; *hypothecium colourless*; spores 8, colourless, ellipsoid, 1-septate, minute.

On leaves of box, rare. 1868.

SYN :—*Lecanora Bouteillei*, Desmaz. Cr. Fr. ed. 2. 1195. (1847.) Nyl. Lapp Or. 152.

EXS :—Arn. 331.

GEOG. DISTRIB :—France, Germany.

BOT. PROV :—2.

ENGLAND :—Danny Sandfield ! Sussex. *Mr. Larchestier*.

157. *L. atropurpurea*, Schær. *greenish-grey, granuloso-leprose*, effuse, (K—C—) ; apothecia *purplish-black*, (*reddish-brown when moist*,) minute, scattered, sessile, plane or convex, margin thin, entire ; *hypothecium pale* ; spores 8, colourless, elliptical or ovate, 1-septate.

On trees, not common.

SYN :—Schær. Enum. 140 (1850.) Crombie Enum. 64.

EXS :—Zw. 343. 371. Arn. 76.

GEOG. DISTRIB :—Switzerland, Germany.

BOT. PROV :—2...19.

ENGLAND :—New Forest. *Rev. J. M. Crombie*, Hurstpierpoint ! near Tunbridge Wells ! *Mr. Borrer*.

IRELAND :—Killarney and Glengariff, *Adm. Jones*. Turk Dinis Island and Cromaglowin, Killarney ; Glubower Wood, Killeagh. *Mr. Carroll*.

#### D. *Spores 1-3-septate (sometimes simple.)*

158. *L. subviridescens*, Nyl. *virescent*, very thin, opaque, or obsolete ; apothecia *fuscous*, opaque or *fusco-livenscent*, convex, immarginate, *dark within* ; spores 8, colourless, oblong, simple or 1-3-septate ; paraphyses indistinct ; epithecium and *hypothecium dusky* ; gelatina hymenea blue, then vinous-red, with iodine.

On the earth in maritime localities, rare. 1868.

Like *L. viridescens*, Ach.

SYN :—Nyl in Flora 1868. p. 474. Crombie En. 71.

GEOG. DISTRIB :—Europe,

BOT. PROV :—31.

CHANNEL ISLANDS :—Boulay Bay, Jersey. *Mr. Larchestier*.

159. *L. subturgidula*, Nyl. *whitish or virescent*, very thin, effuse ; apothecia *livid* or pale dusky-livid, opaque, convex, immarginate, in section *hypothecium fuscous with a superior albicant stratum* ; spores 8, colourless, oblong, simple or 1-3-septate ; paraphyses indistinct ; epithecium white ; *hypothecium fuscous* ; gelatina hymenea blue, then often fulvescent, with iodine.

On holly, rare. 1868.

Approaches *L. aprochrocella*, Nyl.

SYN :—Nyl in Flora 1868. p. 343. Crombie En. 72.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2.

ENGLAND:—Near Lyndhurst in the New Forest! *Rev. J. M. Crombie*. (1868.)

160. *L. Caradocensis*, Leight. dull grey-greenish-olive, cartilaginous, effuse, rimoso-areolate, *granulato-errucose*, scales minute, adnate, roundish, *convex, crimped or wrinkled*, more or less minutely crenulate, (K yellow C orange-yellow); *apothecia* dull black, sessile on the areole, more or less imbedded; scattered or confluent, margin thin, flexuose; *hypothecium* rufo-fuscous or dark brown; spores 8, colourless, elliptico-fusiform, 3-septate, (sometimes 1 or 2-septate,) minute.

On fir trees, old palings, &c., frequent. 1854.

SYN:—Leight. Lich. Brit. Exs. 160. (1854.) Ann. and Mag. Nat. Hist. Dec. 1864.

FIG:—Ann. and Mag. Nat. Hist. Dec. 1864, t. 9, f. 6. 7. 10.

EXS:—Leight. 160.

GEOG. DISTRIB:—Europe.

BOT. PROV:—2, 3...5...8.

ENGLAND:—Aymestry! Herefordshire. *Rev. J. F. Crouch*. north side Gopsall Wood near Twycross, Leicestershire. ! *Rev. A. Blacum*. Ombersley! near Worcester; Whippet: near North Malvern! *Dr. Holl*. Kelvedon, Mark's Hall, Essex. *Mr. Varenne*. Heaton; Finchley; and Totteridge, Middlesex; New Forest. *Rev. J. M. Crombie*. S. & W. bases of Cae Caradoc! (1854); Meole Brace near Shrewsbury!; Eastern base of Wrekin! Shropshire.

161. *L. incompta*, Borr. cinereo-virescent, thin, crustaceous, *unequal, sub-granuloso-furfuraceous*; *apothecia* dull black, numerous, plane, margin thin, flexuose; *hypothecium* thick, black; spores 8, colourless, *shortly linear-cylindrical*, 1-2-3-septate.

On trees, frequent. 1831.

SYN:—Borr. in E. Bot. Suppl. 2699. (1831.) Nyl. Scand. 210.

FIG:—E. Bot. Suppl. 2699.

EXS:—Leight. 162. Schær. 212. Fellm. 175. 176. Anzi It. 8. 260. Bohl. 102. Mass. 317. Zw. 335. Körb. 283.

GEOG. DISTRIB:—Switzerland, Italy, Germany, E. Lapland.

BOT. PROV:—1, 2, 3, 5...10. 24...31.

ENGLAND:—Sternbury and Hurdpierpoint! Sussex. *Mr. Borrer*. (1831.) Kildale! Yorkshire. *Mr. Budd*. The Lodge near Lullow! *Rev. T. Salween*. Danny, Sussex. *Mr. Lorbalestier*, near Worcester; Notten Bridge near Saltash, Cornwall. *Dr. Holl*. Whitstone Hill; Stoke Wood; Dunsford, Devon. *Mr. Parrill*. Braxted, Essex. *Mr. Varenne*. New Forest. *Rev. J. M. Crombie*.

IRELAND:—Adare near Limerick! *Mr. Carroll*.

CHANNEL ISLANDS:—St. Martin's, Jersey. *Mr. Lorbalestier*.

162. *L. prasinoides*, Nyl. green, thin, sub-granulate or very thin, subleprose, indeterminate; apothecia pale-flesh-colour, minute, somewhat plane, obtusely or obsoletely margined (in dry state without margin, but in moist corneo-hyaline), colourless within; spores 8, colourless, bacillar or fusiformi-bacillar, 1-3-septate; paraphyses slender, colourless at the apices; hypothecium colourless; gelatina hymenea vinous-red with iodine.

On calcareous and sandstone rocks, rare. 1865.

Resembling *L. luteola* var. *chlorotica*, Ach. but with spores even shorter than in the common *L. bacillifera*, Nyl.

SYN:—Nyl. in Flora 1865. p. 146. Crombie En. 74.

GEOG. DISTRIB:—Europe.

BOT. PROV:—19...28.

IRELAND:—Sheepwalk, Armagh. *Adm. Jones*. Dinisín Killarney. *Mr. Hardy*.

E. Spores 3-septate, brown.

\* Hypothecium dark.

163. *L. alboatra*, (Hoffm.) white or albicant, unequal, subfarinose, effuse, sometimes sub-evanescent, (K—C—); apothecia black, albo-suffused or naked, small, adnate, sometimes spuriously lecanoroid; hypothecium fuscous; spores 8, fuscous, ellipsoid, 3-septate, sometimes irregularly muriform.

On trees and pales, common. 1808.

SYN:—Hoffm. Enum. 30. (1784.) Nyl. Scand. 235. *Lecidea corticola*, Ach. Syn. 32.

FIG:—E. Bot. 1892. Hepp Sporen t. 17. f. 148.

EXS:—Schaer. 445. Hepp 148. Zw. 123. Mudd 191. Nyl. 63. Leight. 64. Anzi Ven. 79.

GEOG. DISTRIB:—Sweden, Germany, Switzerland, Italy, Hungary, Bavaria, France, Africa, N. America.

BOT. PROV:—1, 2, 3, 4, 5...7. 10...15...(19—30)...31.

ENGLAND:—Seething, Norfolk. *Sir J. E. Smith*. (1808.) *Marsham*! Yorkshire. *Mr. Mudd*. *Lewes*! *Mr. D. Turner*. *Sussex*! *Mr. Borrer*. *Oswestry*, Shropshire. *Rev. T. Salway*. near Worcester. *Dr. Holl*. *Kelvedon*, Essex. *Mr. Varenne*. *Middleland Counties*. *Mr. Purton*. *Cambridgeshire*. *Rev. R. Relhan*. near Exeter. *Rev. J. M. Crombie*. *Montford Bridge*! *Nobold*! *Shelton*! near *Shrewsbury*; *Worfield*! Shropshire.

SCOTLAND:—Killin. *Dr. Holl*.

IRELAND:—Not unfrequent. *Mr. Carroll*.

WALES:—Near Dinas Bran, Llangollen!

CHANNEL ISLANDS:—Jersey, Guernsey. *Mr. Larbalestier*.

forma *leucoplaca*, DC. greyish-white, sub-orbicular, de-



terminate, unequal or areolato-verrucose, (K—C—) ;  
*apothecia constantly naked.*

On poplar, not common. 1860.

SYN :—DC. Fl. Fr. 2. p. 347. (1805.) Nyl. Scand. 235. *Diplomatoma populorum*, Mass. Ric. 99. Mudd. Man. 218.

FIG :—Mass. Ric. f. 201.

EXS :—Nyl. 65. Mass. 289. Zw. 230. Anzi Etr. 33. Mudd 192.

GEOG. DISTRIB :—France, Italy, Germany, Hungary.

BOT. PROV :—10.

ENGLAND :—Near Easby and Carlton, Cleveland. *Mr. Mudd* (1860).

*forma epipolia*, (Ach.) *greyish-white*, sub-orbicular, sub-determinate, *areolato-rimulose*, (K—C—) ; *apothecia innato-sessile*, *cæsio-pruinose*, with a *pseudo-thalline margin*.

On calcareous rocks and walls, frequent. 1803.

SYN :—Ach. Prodr. 58. (1798.) Syn. 32. Nyl. Scand. 235.

FIG :—E. Bot. 1137. Hepp Sporen t. 17. f. 146.

EXS :—Nyl. 64. Hepp. 146. Zw. 229. 351. Mudd 193. Leight. 241. Mass. 356.

GEOG. DISTRIB :—France, Switzerland, Germany, Sweden, Italy, Pyrenees.

BOT. PROV :—1...3, 4, 5...7...10...19...23...31.

ENGLAND :—Near Ayton! Pinchingthorp Wood! Cleveland. *Mr. Mudd*. Oswestry, Shropshire. *Rev. T. Salwey*. Market Dereham Church, Norfolk. (1803) ; Suffolk. *Mr. Turner*. Malvern Hills. *Dr. Holl*. Ide near Exeter. *Mr. Parfitt*. Kelvedon ; Coggeshall, Essex. *Mr. Varenne*. Midland Counties. *Mr. Purton*. Tong Priory! Llanymynech Hill! Shropshire.

IRELAND :—Portmarnock! Dublin. *Dr. Taylor*. near Cork! *Mr. Carroll*.

WALES :—Dolbadern Castle! Snowdon.

CHANNEL ISLANDS :—Jersey ; Guernsey. *Mr. Larbalestier*.

164. *L. calcarea*, (Weis.) *white*, orbicular, determinate, *tartareo-farinose*, *rimuloso-areolate* in the centre, sub-effigurate at the circumference, (K—C—) ; *apothecia* largish, black, *innate*, plane, *cæsio-pruinose*, when old *convex*, with *white thallodal margin*, proper margin black, persistent ; *hypothecium fuscous-black* ; spores 8, fuscous, narrowly oblong or lineari-oblong, 3-septate.

On calcareous rocks, frequent. 1808.

SYN :—Weis Cr. Gotting. 40. (1772.) Mudd Man. 219. *L. speciosa*, E. Bot!

FIG :—E. Bot. 1864.

EXS :—Mass. 15. M. & N. 943. Schær. 230. Anzi It. S. 311. Arn. 215.

GEOG. DISTRIB:—Italy, Switzerland, Germany, Hungary, Bavaria  
BOT. PROV:—1, 2...7, 8...15, 16.

ENGLAND:—Near Newhaven! Sussex. *Mr. Borrer*. (1808.) The Frith, near Buxton. *Dr. Holl*. Ide near Exeter. *Mr. Parfitt*.

SCOTLAND:—Ben Lawers. *Dr. Holl*. Morrone, Craig Guie, Appin. *Rev. J. M. Crombie*.

WALES:—Llandudno, Great Ormes's Head!

165. *L. chlorophæa*, Hepp MS. *tawny* or creamy-white, *verrucose* or *areolato-rimulose*, unequal, scattered or sub-determinate, (K yellow then red); *apothecia* numerous, small, *subinnate-sessile*, black, *slightly pruinose*, plane or convex; *hypothecium* dark-brown; spores 8, fuscous, oblong, 3-septate, irregularly muriform.

On maritime rocks, rare. 1868.

SYN:—Hepp MS. in herb. Arnold!

GEOG. DISTRIB:—Germany, Italy.

BOT. PROV:—7.

WALES.—Aberdovey! North Wales. *Rev. A. Bloxam*. (1868).

166. *L. deducta*, Nyl. *greenish*, effuse, obscurely *sub-gelatinous*; *apothecia* blackish, small, *usually margined*, reddish in a thin section; *hypothecium* more obscure in the middle; spores 8, *colourless* or *faintly blackish*, elliptical or oblong, 1-or 3-septate; paraphyses indistinct; *gelatina hymenea* blue, then vinous-red, with iodine.

On old felled holly stumps, very rare. 1869.

Perhaps only a var. of *L. suburgidula*, Nyl. but differing chiefly in the black and marginate apothecia.

SYN:—Crombie in Seem. Journ. Bot. 7. 233. (1869.) Enum. 72.

GEOG. DISTRIB:—Europe.

BOT. PROV:—2.

ENGLAND:—Near to Brockenhurst in New Forest! *Rev. J. M. Crombie*. (1869).

167. *L. postuma*, Nyl. *cinerascent*, evanescent; *apothecia* black, rather minute, somewhat plane, *marginate*, *concolorous within*; *hypothecium* and *epithecium* *fuscescent*; spores 6-8, colourless or fuscous, ellipsoideo-oblong, 3-septate, generally with a few oblique or longitudinal septulæ.

On calcareous stones in gravelly mountain localities, rare. 1868.

Possibly a starved variety of *L. petraea*.

SYN:—Nyl. in Flora 1868. p. 345. Crombie En, 87.

GEOG. DISTRIB:—Europe.

BOT. PROV:—15.

SCOTLAND :—Morrone, Braemar. *Rev. J. M. Crombie*. (1868).

168. *L. triphragmia*, Nyl. similar to *L. disciformis* in the thallus and general habit, but with spores 3-septate.

On shady rocks in sub-alpine districts, rare. 1870.

SYN :—Nyl. Prodr. 141. (1857.) Crombie in Seem. Journ. 9. 179.

GEOG. DISTRIB :—Scandinavia.

BOT. PROV :—15.

SCOTLAND :—Morrone, Braemar. *Rev. J. M. Crombie*. (1870).

**F. Spores 3-septate, colourless.**

**\* *Hypothecium* dark.**

169. *L. melena*, Nyl. *fusco-nigricant, leproso-granulose*, thin, effuse, (K—C—); *apothecia* minute, convex, black, internally concolorous, immarginate; *hypothecium* black; spores 8, colourless, lineari-oblong, 3-septate.

On the earth and old wood, rare.

SYN :—Nyl. in Bot. Notis. 1853. p. 182. Scand. 205.

EXS :—Fries L. S. Exs. 212. B. (fide Nyl.) M. & N. 1329. Fellm. 159.

GEOG. DISTRIB :—Scandinavia, Switzerland.

BOT. PROV :—2...15 ..19 ..23.

ENGLAND :—New Forest. *Rev. J. M. Crombie*.

SCOTLAND :—Grampians; Braemar. *Rev. J. M. Crombie*. f. 15

IRELAND :—Howth. *Adm. Jones.*, Crogham, Killarney. *Mr. Carroll*.

170. *L. trachona*, (Ach.) *virescent*, thin, leprose, minutely areolate, (K—C—); *apothecia* minute, sessile, black, scattered or confluent, convex, margin obliterated; *hypothecium* black; spores 8, colourless, lineari-oblong, 3-septate.

On maritime rocks, rare. 1868.

SYN :—*Ferrucaria*, Ach. Syn. 96. Nyl. in Flora 1864. p. 620. Crombie Enum. 71.

EXS :—Zw. 117. 104. Rabh. 846. Larbal. 80

GEOG. DISTRIB :—Germany, Sweden

BOT. PROV :—31.

CHANNEL ISLANDS :—Warren, Noirmont ! Jersey. *Mr. Larbal-estier*.

171. *L. Ederi*, Ach. *ochraceo-ferruginous*, thin, areolate or areolato-granulose, (K—C—); *apothecia* small, umbonate or generally plicate or sub-gyrose, black,

plane, margin thin, flexuose ; *hypothecium* black ; spores 8, colourless, oblong, 3-septate, nucleolate.

On mountain and maritime rocks, frequent.

SYN :—Ach. Prod. 66. (1798.) Syn. 22. Nyl. Scand. 234.

FIG :—Hepp Sporen t. 59. f. 508.

EXS :—Fries L. S. 384. Hepp 508. Leight. 187. Zw. 28. Körb. 285.

GEOG. DISTRIB :—Switzerland, Bavaria, Austria, Sweden.

BOT. PROV :—1...7...10...15...19...30.

ENGLAND :—Lonsdale ! Cleveland. Mr. Mudd. Launceston. Cornwall. Dr. Holl.

SCOTLAND :—Ben Lawers. Dr. Holl. Castleton of Braemar ; Blair Athole ; Coast of Kincardine. Rev. J. M. Crombie.

IRELAND :—Mangerton. Dr. Taylor. co. Antrim. Adm. Jones.

WALES :—Aberdovey ! Rev. A. Bloxam. Cader Idris. Dr. Holl. Dolgelly ! Barmouth ! Glyder Vach ! Llyn Cwlyd !

172. *L. abietina*, Ach. white or whitish, thin, leprose, effuse, (K—C—) ; apothecia moderate or large, numerous, scattered, sessile, black, thickly suffused with a whitish or pale-yellowish pruina, rarely naked, plane or sub-convex, margin thickish, prominent, flexuose ; *hypothecium* black ; spores 8, colourless, aciculari-fusiform or sub-bacilliform, 3-septate.

On old trees in mountainous regions, not unfrequent.

1830.

*Verrucaria leucocephala*, E. Bot. Suppl. 2642. f. 2. and *Pyrenotheca leucocephala*, Leight. Ang. Lich. t. 28. f. 1. Exs. 164. are the spermogonia.

SYN :—Ach. L. U. 188. (1810.) Syn. 30. Nyl. Scand. 241.

FIG :—E. Bot. Suppl. 2642. fig. 2. Leight. Ang. Lich. t. 28. fig. 2.

EXS :—Schær. 534. 533. Hepp 517. Arn. 88. Leight. 163. Mudd 200.

GEOG. DISTRIB :—Sweden, Germany, Switzerland, Bavaria.

BOT. PROV :—1, 2...8...10...19...29...31.

ENGLAND :—New Forest ! Mr. Lyell. (1830.) Westerdale ! Stogdale ! Hobhole ! Cleveland. Mr. Mudd. Devon. Mr. Parfitt. Bradgate Park, Leicestershire. Rev. A. Bloxam.

IRELAND :—Killarney and Carig Mountain, Kerry. Dr. Taylor. Donegal. Dr. Moore. Crogham and Eagle's Nest, Killarney. Mr. Carroll.

CHANNEL ISLANDS :—Jersey ; Guernsey. Mr. Larbalestier.

173. *L. Turneri*, Leight. glaucous-white, thick, tartareo-farinose, areolato-verrucose, turgid, (K—C—) ; apothecia solitary or confluent, appressed-sessile, black, plane or convex ; *hypothecium* black, thick ; spores 8, colour-

less, lineari-cylindrical or lineari-fusiform, 3-septate, (occasionally 2-or 4-septate,) *small*.

On mortar, in walls, &c. rare.

Similar in general appearance to *L. mamillaris*, but distinct by the spores and reaction, both from that and *L. Dilleniana*.

SYN :—*L. candida*, E. Bot. 1138. (1803).

FIG :—E. Bot. 1138.

GEOG. DISTRIB :—Europe.

BOT. PROV :—4.

ENGLAND :—Trigby Church ! near Yarmouth. *Mr. Turner*.

174. *L. carbonacea*, (Anzi,) *fuscous-black*, sub-orbicular, thick, *glebuloso-diffract*, *squamules* small, *rugoso-conver*, *entire* or *inciso-crenate*, (K—C—); apothecia small, black, sessile, solitary or aggregate, plane, margined, eventually convex and immarginate; *hypothecium* thick, *reddish-black*; spores 8, colourless, "*bacilliform*," straight or curved, 3-septate.

On calcareous rocks, rare. 1870

SYN :—*Toninia*, Anzi Cat. Sondr. 68. (1860.) Crombie Enum. 78.

EXS :—Anzi Langob. 115.

GEOG. DISTRIB :—Lombardy.

BOT. PROV :—15.

SCOTLAND :—Craig Guie, Braemar. *Rev. J. M. Crombie*. (1870.)

175. *L. squamulosa*, Deak. MS. *pale-brown*, thin, crustaceo-cartilaginous, *squamulose*, *squamulæ* sub-imbricated or flattish, appressed and rimulose, *crenate*, (K *yellow*, then turning *dusky*); apothecia small, solitary or aggregated, appressed or sub-sessile, plane or convex and deformed, black, margin thickish; *hypothecium* *nigro-fuscous*; spores 8, colourless, *lineari-cylindrical*, 3-septate, cells nucleolate, half the size of those of *L. aromatica*.

On rocks and walls, not frequent. 1853.

SYN :—Salwey in Penzance Nat. Hist. Soc. Trans. 1853. p. 144. Mudd Man. 174.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1...1...15...19...28...31.

ENGLAND :—Trenwainton ! Penzance. *Rev. T. Salwey*. (1853.) Torquay ! Devon. *Dr. Deakin*. Matlock ! *Mr. Wilson*. Penzance. *Mr. W. Curnow*.

SCOTLAND :—Slaghead Kirk, Coast of Kincardine; near Stonehaven, Kincardineshire. *Rev. J. M. Crombie*.

IRELAND :—Blackrock ! *Mr. Carroll*. Armagh. *Adm. Jones*.

CHANNEL ISLANDS :—Herm. *Mr. Larbalestier*.



176. *L. aromatica*, (Sin.) *greyish white*, tartareous, rugose, *granulato-congested*, (K faintly yellow); apothecia small, solitary or aggregated, sub-sessile, plane, black; *hypothecium nigricant*; spores 8, colourless, *oblongo-cylindrical*, 3-septate.

On the earth, old walls, rocks, &c. frequent. 1807.

SYN:—Sm. E. Bot. 1777. (1807.) Ach. Syn. 19. Nyl. Prod. 123.

FIG:—E. Bot. 1777. Hepp Sporen t. 32. f. 283.

EXS:—Leight. 154. Zw. 280. Larbal. 85.

GEOG. DISTRIB:—France, Algeria, Italy, Germany.

BOT. PROV:—1, 2...4, 5...7...11...16...19.. 31.

ENGLAND:—Yarmouth. *Mr. Turner*. (1807.) Sussex Downs! *Mr. Borrer*. Torquay! *Dr. Deakin*. near Eglestone, Durham. *Rev. J. Harriman*. near Exeter. *Mr. Hemmings*. Whittington near Worcester; Bolt Head; Fairlight near Hastings; Isle of Wight. *Dr. Holl*. Budleigh Salterton, Devon. *Dr. Dickie*. Plymouth. *Mr. Holmes*. Penzance. *Mr. Curnow*.

SCOTLAND:—Appin. *Rev. J. M. Crombie*.

IRELAND:—Near Blarney! Upper Glanmire! near Cork. *Mr. Carroll*.

WALES:—Barmouth! Dolgelley! Dolbadern Castle! Snowdon.

CHANNEL ISLANDS:—St. Aubin's Harbour, Mont Orgueil Castle, Jersey! and on all the Islands. *Mr. Larbalestier*.

A var. *hypnophila*, Nyl. has been found on mosses on Ben Lawers by *Adm. Jones*. (Crombie En. 78.)

177. *L. Dilleniana*, (Ach.) *albo-cinerascent* or *cinereo-nigrescent*, *granulose* or *diffract*, *sub-gyroso-verrucose*, (K yellow C orange); apothecia black, naked or *albo-pruinose*, appresso-sessile, scattered or aggregate; *hypothecium nigro-fuscous*, almost *nigricant*; spores 8, colourless, *aciculari-fusiform*, 3-septate, large.

On maritime and subalpine rocks, rare.

I have a specimen in my herb. gathered at Norköping by Wahlenberg. Anzi Ven. 82. 83. and Zw. 142. and Schær. 580. have a different reaction K yellow C red.

SYN:—Ach. Prod. 57. (1798.) Syn. 30. Nyl. Scand. 240.

FIG:—Ach. Prodr. t. 1. f. 1.

EXS:—Leight. 336. Mudd 199.

GEOG. DISTRIB:—Sweden.

BOT. PROV:—3...7...10...12...15.

ENGLAND:—Cleveland! Yorkshire. *Mr. Mudd*. Brightlingsea! *Mr. Varcenne*. Staveley near Kendal. *Mr. Martindale*.

SCOTLAND:—Trosachs; Aviemore; and Achallater, Braemar. *Rev. J. M. Crombie*.

WALES:—Aberdovey! *Rev. A. Bloxam*.

178. *L. rhexoblephara*, Nyl. *albido-cinerascent*, very thin or evanescent; *apothecia black*, moderate, plane, *margin thick, rhagadioso-diffract or crenate, internally concolorous, hymenium whitish; hypothecium dark-fus-cous; spores 8, colourless, oblongo-ellipsoid or fusiformi-ellipsoid, 3-septate.*

On decaying mosses in alpine localities, rare. 1861.

SYN:—Nyl. in Ofvers. V. Ak. Förk. 1860. p. 297. Scand. 240.

GEOG. DISTRIB:—Norway, Behrings Straits.

BOT. PROV:—15.

SCOTLAND:—Ben Lawers. *Adm. Jones.* (1861).

179. *L. mesoidea*, Nyl. *cinerascent*, thin, sub-opake, unequal, *sub-areolato-rimulose; apothecia black*, moderate, younger ones margined, then sub-convex and the margin evanescent, *concolorous within; spores 8, colourless, oblong, 3-septate; paraphyses moderate, apices nigricant; hypothecium black with a yellowish-red or cerasino-rufescent middle stratum; gelatina hymenea cærulescent, then violet, with iodine.*

On maritime micaceo-schistose rocks, rare. 1868.

Approaching *L. acclinis*, (Flot.) but differs in the hypothecium, as also from *L. squamulosa*, Deak. by the distinct upper stratum of the hypothecium.

SYN:—Nyl. in Flora 1868. p. 475. Crombie En. 78.

GEOG. DISTRIB:—Europe.

BOT. PROV:—31.

CHANNEL ISLANDS:—Sark. *Mr. Larbalestier.*

180. *L. premneoidea*, Nyl. *pallido-virescent* or *cinereo-virescent*, slightly *leprose*, effuse, (K—C—); *apothecia black*, moderate, margined, plane, *epithecium* sometimes *sub-virescenti-suffused; spores 8, colourless, oblong, obsoletely 3-septate; paraphyses slender; hypothecium black; gelatina hymenea vinous-red with iodine.*

On walls in maritime localities, rare. 1865.

Allied to *L. aromatica*, Ach. and *granosa*, Tuck. and with the aspect of *L. premnea*, Ach.

SYN:—Nyl. in Flora 1865. p. 147. Crombie. En. 79.

GEOG. DISTRIB:—Europe.

BOT. PROV:—31.

CHANNEL ISLANDS:—Noirmont! Jersey. *Mr. Larbalestier.*

**\*\* *Hypothecium pale.***

181. *L. geotica*, (Whlhb.) *cinerascent*, thin, *sub pulve-*

ruled, sub-evanescent; apothecia minute, immersed, cupular, waxy, pale-yellow-flesh, margin entire, persistent, white; hypothecium pale; spores 8, colourless oblong, or ellipsoid, 3-septate.

On the ground among mosses, not common. 1870.

SYN:—Whlhb. Vet. Ak. II. 1806. p. 142. Ach. Syn. 9, Nyl. Scand. 190.

FIG:—Vet. Ak. II. 1806. t. 4. f. 5, Leight. Ang. Lich. t. 13. f. 2.

EXS:—Leight. 123.

GEOG. DISTRIB:—Gothland, Finland.

BOT. PROV:—5...15.

ENGLAND:—Wickeliff rocks near Ludlow! *Rev. T. Salwey.*

SCOTLAND:—Ben Lawers! *Rev. J. M. Crombie.* (1870).

182. *L. foveolaris*, (Ach.) whitish, crustaceous, minutely verrucoso-granulate, effuse, (K—C—); apothecia immersed, foveolate, rather large, pale-yellow-flesh-coloured, margin entire, paler; hypothecium colourless; spores 8, colourless, oblong or ellipsoid, 3-septate.

On moist turfy earth, rare.

SYN:—*Urceolaria*, Ach. Meth. 149. (1803.) *Gyalecta Wahlenbergiana*, Ach. Syn. 9. *Lecidea*, Nyl. Scan. 190.

FIG:—Mass. Ric. f. 284.

EXS:—Th. M. Fries 10. Fellm. 146. Arn. 343. Anzi Langob. 131.

GEOG. DISTRIB:—Finmark, E. Lapland, Germany, Italy.

BOT. PROV:—8...10, 11...15.

ENGLAND:—Teesdale, Durham. *Rev. J. Harriman.* near Boltby, Thirsk, Yorkshire. *Mr. Baker.* near Newton, Cleveland. *Mr. Mudd.* Charnwood Forest, Leicestershire. *Rev. A. Bloxam.*

SCOTLAND:—Ben Lawers; Morrone. *Rev. J. M. Crombie.* Finlarig near Killin. *Dr. Holl.*

183. *L. exanthematica*, (Sm.) cinerascens, very thin or evanescent, (K—C—); apothecia pale-yellow, small, margin connivent, radiato-fissured, at length exposing the epithecium; hypothecium pale yellow; spores 8, colourless, lineari-oblong or cylindrical, 3-septate, large.

On calcareous rocks, frequent. 1791.

SYN:—Sm. Linn. Soc. Tr. 1. 81. (1791.) *Thelotrema*, Leight. Ang. Lich. 32. Ach. Syn. 116. *Lecidea*, Nyl. Scand. 188.

FIG:—E. Bot. 1184. Leight. Ang. Lich. t. 12. f. 3.

EXS:—Anzi It. S. 235. Zw. 211. Hepp 206. M. & N. 846. Schær. 122. Leight. 256.

GEOG. DISTRIB:—Switzerland, Germany, Hungary, Italy, Sweden.

BOT. PROV:—2...5...7...10, 11...19...28...30.

ENGLAND:—Banks of Tees, Durham! *Rev. J. Harriman.* Sus-

sex Downs! *Mr. Borrer*. Ingleborough. *Dr. Carrington*. Durdham Down near Bristol. *Miss Atwood*, Rokeley and Barnardcastle, Durham. *Mr. Winch*.

IRELAND:—Killarney! *Dr. Taylor*. near Belfast. *Mr. Templeton*. Sheepwalk, Armagh. *Adm. Jones*.

WALES:—Eglswg rocks! near Llangollen.

184. *L. carneo-lutea*, (Turn.) whitish, glaucescent, thin, smooth, effuse, (K—C—); apothecia numerous, minute, innato-emergent, at first veiled by the pale hypothecium, which afterwards is irregularly stellato-dehiscent, disclosing the plane yellow-flesh-coloured disk, margin albicant, lacerate or crenate; spores 8, colourless, lineari-oblong, 3-septate.

On trees especially elm, rarely on ash. 1808.

SYN:—Turn. Trans. Linn. Soc. 9. 145. (1808.) Nyl. Prodr. 101.

FIG:—Trans. Linn. Soc. t. 12. f. 2. E. Bot. 2010. Leight. Brit. Ang. Lich. t. 14. f. 2.

EXS:—Fries 342. Larbal. 30. Leight. 363.

GEOG. DISTRIB:—Sweden.

BOT. PROV:—1, 2, 3...31.

ENGLAND:—Sussex! and Isle of Wight. *Mr. Borrer*. (1808.) Torquay! Devon. *Dr. Deakin*. Shoreham, Sussex. *Mr. Larbalestier*. near Ventnor, Isle of Wight; Ilsam, Torquay. *Dr. Holl*. Cawick fields, Exeter. *Mr. Parfitt*. Beeding Priory, Sussex. ! *Rev. A. Blozam*. Penzance. *Mr. Curnow*.

CHANNEL ISLANDS:—Quenvais; St. Brelade's! Jersey; Saint's Bay, Guernsey. *Mr. Larbalestier*.

185. *L. violacea*, Crouan. albidocinerascent, very thin, almost evanescent; apothecia pallido-livid, small, sub-convex; hypothecium colourless; spores 8, colourless, oblong, obtuse, 3-septate.

On maritime rocks, rare. 1860.

SYN:—Nyl. in Flora 1862. p. 464. Crombie En. 71.

GEOG. DISTRIB:—France.

BOT. PROV:—18.

SCOTLAND:—Lerwick, Shetland. *Adm. Jones*. (1860).

186. *L. cupreo-rosella*, Nyl. bright-copper-colour, somewhat virescent, leprose, pulveraceo-granulose, at length areolate; apothecia black, minute, at first punctiform, then patellulate, castaneo-fuscous and pale red, marginate; hypothecium colourless; spores 8, colourless, lineari-elliptical, subacicular, 3-septate.

On peaty earth, rare. 1869.

SYN:—Nyl. Enum. 122. (1858.) *Bilimbia cuprea*, Mass. Ser. 77. (1856).

GEOG. DISTRIB:—Bavaria.

BOT. PROV:—10.

ENGLAND:—Bilsdale, Yorkshire. *Mr. Mudd.* (1869).

187. *L. circumpallens*, Nyl. *pallido-cinerascent*, thin, *rimose*; *apothecia fuscous-black* or *fusco-rufescent*, plane or sub-convex, margin pale; *hypothecium* colourless; *spores* 8, colourless, *fusiform* or *fusiformi-acicular*, straight, 3-septate.

On argillaceous earth, rare.

Nyl. l. c. remarks “vix nisi varietas *L. bacillifera*.”

SYN:—Nyl. in Flora 1866, p. 370.

GEOG. DISTRIB:—Europe.

BOT. PROV:—24.

IRELAND:—Kilkee and Ross co Clare. *Mr. Carroll.*

188. *L. sphæroides*, Smrf. *albo-virescent*, *granulose*, sub-pulverulent; *apothecia pale-whitish* or *pale-yellow-flesh-colour*, *congregate*, convex, sub-globose; *hypothecium* pale; *spores* 8, colourless, oblongo-fusiform, 3-septate.

On trees and mosses, not common.

SYN:—Smrft. Lapp. 164. (1826.) Nyl. Scand. 204. Crombie En. 70.

EXS:—Fellm. 158. Anzi Langob. 261.

GEOG. DISTRIB:—Scandinavia, Italy, Switzerland, Germany.

BOT. PROV:—1...3...15...28.

ENGLAND:—Lustleigh Cleve; Barrack wall, Topsham road, Exeter. *Mr. Parfitt.* Kelvedon; Feering, Essex. *Mr. Varnae.*

SCOTLAND:—Midland parts. *Rev. J. M. Crombie.* Aberfeldy. *Dr. Holl.*

IRELAND:—(f. *rediens*, Nyl.) Florencecourt, Fermanagh. *Adm. Jones.* (f. *vacillans*, “apotheciis rufescentibus, sporis 1-3 septatis,”) Armagh demesne. *Adm. Jones.*

### G. *Spores multiseptate.*

189. *L. pachycarpa*, (Duf.) *creamy-yellow*, sub-tartareous, *thickish*, effuse, *pulverulento-furfuraceous*; *apothecia large*, scattered, *adnate*, *reddish-brown*, plane or tumid, *margin paler*, *obtuse*; *hypothecium* *pale-yellowish-brown*; *spores* 1, very large, colourless, elongato-oblong or cylindrical, 10-septate.

On trees, rare. 1806.

SYN:—Dufour in Fries L. Eur. 259. (1831.) Nyl. Prod. 118.

FIG:—E. Bot. 1683. Hepp Sporen t. 27. f. 234.

EXS:—Zw. 80.



GEOG. DISTRIB :—Switzerland, Bavaria, France.

BOT. PROV :—1, 2...5...7, 8...19.

ENGLAND : —New Forest! *Mr. Lyell*. (1806.) Sussex. *Mr. Turner*. Tilgate Forest and St. Leonard's Forest! Sussex. *Mr. Borrer*. Charnwood Forest! *Rev. A. Bloxam*. Stoke Wood, Devon. *Mr. Parfitt*. Midland Counties. *Mr. Parton*. near Hastings. *Rev. J. M. Crombie*. Old Woods in Sussex. *Mr. Sowerby*.

IRELAND : —Cromaglaw, Killarney! *Dr. Moore*. Castlebernard co. Cork; Dinis, Killarney. *Mr. Carroll*.

WALES : —Cwm Bychan! *Rev. T. Salwey*.

190. *L. homalotropa*, Nyl. *white*, glabrous, very thin or *albo-macular*, sub-determinate; *apothecia black*, moderate, plane, margined; *hypothecium thin*, *nigricant*; *epithecium sub-rugose*, dusky; spores 8, colourless, cylindrical, closely multiseptate; paraphyses slender, anastomosing; *gelatina hymenea* untinged with iodine.

On old ash trees in sub-alpine regions, rare. 1867.

Near to *L. urceolata*, Ach. Doubtful if not both referable to *Melaspilea*.

SYN :—Nyl. in Flora 1867. p. 329. Crombie En. 90.

GEOG. DISTRIB :—Europe.

BOT. PROV :—19.

IRELAND : —Near Derryeunihy, and Eagle's Nest, and between Killarney and Kenmare. (1867); and on Mc Carthy Island in upper lake of Killarney. *Mr. Carroll*.

191. *L. premnea*, Ach. *cinerascent* or *cinereo-virescent*, very thin, effuse, (K—C—); *apothecia black*, opaque, *naked* or *virescenti-pruinose*, moderate, plane, *margin thin*, prominent, *flexuose*; *hypothecium black*; spores 8, colourless, oblongo-or broadly-fusiform, apices acute, 5-septate.

On old trees and rocks, frequent. 1785.

SYN :—Ach. L. U. 173. (et var. *laxicola*, 671.) (1810.) Syn. 17. Nyl. Scand. 241.

FIG :—E. Bot. 1682. Leight. Ang. Lich. t. 28. f. 3.

EXS :—Bohl. 101. Mudd 197. 198. Leight. 121. 185. Zw. 15. Hepp 514. 515. Nyl. 67.

GEOG. DISTRIB :—Switzerland, Germany, France, Java.

BOT. PROV :—1, 2, 3, 4, 5...7...10, 11, 12...19...24...26...31.

ENGLAND : —Epping Forest. *Afzelius*. Plymouth. *Mr. Holmes*. Hill Beck, Westmoreland. *Rev. J. Harriman*. Suffolk. *Rev. Mr. Leathers*. North of England. *Dr. Dickson*. (1785.) near Bristol. *Miss Atwood*. Kildale! Hoggarts Wood, Airyholme Wood! Cleveland. *Mr. Mudd*. Middleton Lane! Oswestry. *Rev. T. Salwey*. (forma *trichopora*, Nyl.) Lale Monachorum! Devon. *Mr. Larchal-stier*. near Worcester. *Dr. Holl*. Red Hills, Exeter. *Mr. Parfitt*. Riven-

hall; Kelvedon! Mark's Hall, Essex. *Mr. Varenne*. New Forest. *Rev. J. M. Crombie*. Nesscliffe Hill! Clive Hill! Stableford! Shropshire.

IRELAND:—Curraghmore. *Adm. Jones*. Castlebernard Park and Kilbrittain near Bandon; Adare Abbey, Limerick. *Mr. Carroll*.

WALES:—Between Arddog and Ynysfaig! near Dolgellay. *Rev. T. Salwey*.

CHANNEL ISLANDS:—Guernsey; La Moya, Jersey. *Mr. Lorbalestier*.

192. *L. sabuletorum*, Flk. *albido-cinerascent*, thin, *granuloso-squamulose*, effuse; *apothecia pallido-fuscescent* or *fuscous* or *fusco-nigricant*, convex; *hypothecium slightly brown upwards, otherwise pale*; *spores 8, colourless, broadly fusiform, acute at the apices, 5-septate*.

On decayed mosses, frequent.

SYN:—Flk. in Berl. Mag. 1808. p. 309. Ach. Syn. 20. Nyl. Scand. 204.

FIG:—Mass. Ric. f. 234. Hepp Sporen t. 16. f. 138.

Exs:—Larbal. 81. Hepp 138.

GEOG. DISTRIB:—Sweden, Germany, France.

BOT. PROV:—3...5...7...15...19...31.

ENGLAND:—Oswestry! *Rev. T. Salwey*. Shoreham Church-yard; Tilgate Forest, Sussex. *Mr. Lorbalestier*. Sundorne! Shropshire.

SCOTLAND:—Near Aberdeen. *Rev. J. M. Crombie*.

IRELAND:—Middle Road! near Blackpool! co. Cork. *Mr. Carroll*.

CHANNEL ISLANDS:—Jersey! *Mr. Lorbalestier*.

Var. *Dufourei*, Ach.) *spores 1-septate*, Nyl. in Flora 1867. p. 373. *f. simplicior*, Nyl. Scand. 205. has occurred on Cader Idris! 1866, on moss and earth.

And also another var. *monophragmia*, Nyl. in litt. is mentioned as collected at Morrone, Braemar in Crombie En. 71.

193. *L. milliaria*, Fr. *cinereo-nigrescent*, *coarsely granulose*, effuse; *hypothallus nigro-fuscous*; *apothecia black, crowded, sessile, convex, almost spherical, immarginate*; *hypothecium nigrescent*; *spores 8, colourless, narrowly fusiformi-cylindrical, obtuse at the apices, almost sub-cylindrical, multiseptate*.

On the earth and on decaying wood, common.

SYN:—Fr. L. Eur. 342. (1831.) Nyl. Scand. 205.

Exs:—Fries 29. (fide Nyl.) Zw. 121. Bohl. 85. Leight. 238. Mudd 156. 158.

GEOG. DISTRIB:—Scandinavia, Germany, Africa, America.

BOT. PROV:—1, 2, 3...5...7...10...12...13...15...(19—30)...31.

ENGLAND:—Guisbro' Moor! Cleveland. *Mr. Mudd*. Cumber-

land! *Mrs. Stanger*. Starcross, near Torquay. *Mr. Purcell*. Tip-  
tree Heath, Essex. *Mr. Varcane*. New Forest. *Rev. J. M. Crombie*.  
Caer Caradoc! Long Mynd! Shropshire.

SCOTLAND:—Ayrshire! *Mrs. Dobie*. Ben Lawers; Blair Athol;  
Banchory near Aberdeen. *Rev. J. M. Crombie*.

IRELAND:—Not uncommon. *Mr. Carroll*.

WALES:—Aber! Corwen!

CHANNEL ISLANDS:—Jersey; Guernsey. *Mr. Lorbalester*.

Var. *montana*, Nyl. *cinerascent* or *whitish*, *slightly granulose*; apothecia black, nigricant within; spores narrowly fusiform, obtuse at the apices, almost sub cylindrical, multiseptate.

On mosses in mountain ranges, frequent.

SYN:—Nyl. Scand. 205. (1861).

EXS:—Leight. 386. 38.

GEOG. DISTRIB:—Scandinavia.

BOT. PROV:—7...22.

IRELAND:—Co. Wicklow. *Dr. Moore*.

WALES:—Cader Idris!

Var. *syncomista*, Flk. *thallus granuloso-squamulose*, *squamules concrescent, crenato-lobate*; apothecia black; hypothecium nigricant; spores 8, colourless, narrowly fusiformi-cylindrical, obtuse at the apices, multiseptate.

On sandy earth, rare.

SYN:—Flk. in Berl. Mag. 3. 310. (1808.) Nyl. Scand. 205

EXS:—Anzi Langob. 148. Larbal. 82.

GEOG. DISTRIB:—Europe.

BOT. PROV:—8...15...31.

ENGLAND:—Deep Dale, Buxton. *Dr. Holl*.

SCOTLAND:—Ben Lawers. *Dr. Holl*.

CHANNEL ISLANDS:—Quenvais! Jersey. *Mr. Lorbalestier*.

194. *L. citrinella*, Ach. *citrine* or *bright flavo-virescent*, *granulose, pulverulent*, effuse; apothecia black, appressed, solitary or conglomerate, margin thick, obtuse; hypothecium nigro-fuscous; spores 8, colourless, slender, *elongato acicular, multiseptate, cells containing oily globules*.

On earth and mosses amongst mountains, frequent.  
1793.

SYN:—Ach. Kongl. Vet. Acad. N. II. 16. 135. (1795.) Syn. 23.  
Nyl. Scand. 248.

FIG:—E. Bot. 1877. Sturm Fl. Germ. t. 31. Mudd Man. t. 3. f. 70.

EXS:—Leight. 303.

GEOG. DISTRIB:—Sweden, Bavaria.

BOT. PROV:—1...5...7...11...12, 13...15...19...22.

ENGLAND :—Cumberland! *Mrs. Stanger*. Oswestry! *Rev. T. Salwen*. Teesdale! *Mr. Robertson*. Hay Tor, Dartmoor. *Dr. Holl*.

SCOTLAND :—Ayrshire! *Mrs. Dobie*. Ben Lawers. *Dr. Maingay*. Glen Fender; Blair Athole. *Rev. J. M. Crombie*.

IRELAND :—Bonane! and Kilceanagh co. Kerry. *Dr. Taylor*. co. Wicklow. *Dr. Moore*.

WALES :—Cader Idris. *Dr. Holl*. Llangollen!

195. *L. farinosa*, (Ach.) *white, powdery, unequal, thin, sometimes sub-granulose, (K—C—)*; *apothecia black, albo-pruinose, plane or sub-convex, small; hypothecium nigricant; spores 8, colourless, fusiform, 3-5-septate.*

On old trees, not common.

SYN :—Ach. L. U. 187. (1810.) Syn. 32. Nyl. Scand. 240.

EXS :—Schær. 627. Zw. 124.

GEOG. DISTRIB :—Switzerland, Germany, Sweden.

196. *L. carneola*, Ach. *whitish or granuloso-pulverulent, evanescent; apothecia rufous or carneo-fuscescent, small, adnate, somewhat concave or sub-urceolate, margin thick, elevated, pale; hypothecium pale; spores 8, colourless, elongato-acicular, multiseptate, large.*

On trees, rare. 1794.

SYN :—Ach. L. U. 194. (1810.) Syn. 42. Nyl. Scand. 191.

FIG :—With. 4. t. 31. f. 3. E. Bot. 965. Leight. Ang. Lich. t. 14. f. 4.

EXS :—Leight. 117. Anzi It. S. 261. Zw. 192. Nyl. 132. Hepp 521. Mass. 269.

GEOG. DISTRIB. —Germany, Italy, France, Switzerland, Sweden, N. America.

BOT. PROV :—1, 2...5...7, 8...10, 11...19...31.

ENGLAND :—Eggleston, Durham. *Rev. J. Harriman*. Studley Wood near Ripon. *Mr. Brunton*. Twycross! Leicestershire. *Rev. A. Bloxam*. Sussex! *Mr. Borrer*. Tilgate Forest! Sussex. *Mr. Larbalestier*. Bolton. *Dr. Carrington*. near Lyndhurst in New Forest. *Rev. J. M. Crombie*. Blackstone rock, Devon. *Mr. Parfitt*. Haughmond Hill! Shropshire.

IRELAND :—Dinis, Killarney. *Mr. Carroll*.

WALES :—Garn near Denbigh. *Mr. Griffith*. (1794.)

CHANNEL ISLANDS :—Rozel, Jersey. *Mr. Larbalestier*.

197. *L. endoleuca*, Nyl. *greyish-white or pale tawny, thin, effuse, smooth or granulose; apothecia black, scattered, sessile, plane or plano-convex, margin thick, smooth; hypothecium colourless; spores 8, colourless, elongato-acicular, multiseptate.*

On trees, frequent.

SYN:—Nyl. Obs. Holm. 2. 7. (1853.) Prodr. 114.

EXS:—Leight. 90. 279. Bohl. 90.

GEOG. DISTRIB:—France, Sweden, Switzerland.

BOT. PROV:—1, 2, 3...5...7, 8...10...19...31.

ENGLAND:—Torquay! Devon. *Dr. Deakin*. Oswestry! *Rev. T. Salway*. Twycross! *Rev. A. Bloxam*. Airyholme Wood! Hoggarts Wood, Cleveland. *Mr. Mudd*. Hilk's Wood, Ingleborough. *Dr. Carrington*. near Thirsk. *Mr. Baker*. Essex! *Mr. Piggott*. near Lewes, Sussex. *Mr. Larbalestier*. Haldon and Budleigh Salterton. *Mr. Parfitt*. near Bath; Churchill near Worcester. *Dr. Holl*. Kelvedon; Mark's Hall; Braxted; Sible Hedingham, Essex. *Mr. Varenne*. New Forest. *Rev. J. M. Crombie*. near Shrewsbury! Shropshire.

IRELAND:—(f. *musculicola*, Nyl.) Dinis Island, Killarney. *Mr. Carroll*.

WALES:—Barmouth!

CHANNEL ISLANDS.—Noirmont, Jersey. *Mr. Larbalestier*.

198. *L. rosella*, (Pers.) *cinerascens*, thin, *unequal* or *granulose*; *apothecia* *rose-coloured* or *flesh-coloured*, *sub-pruinose*, moderate, numerous, scattered, sessile, margin thick, obtuse, pale; *hypothecium* *colourless*; spores 3, colourless, bacilliform, multiseptate.

On trees, rare. 1806.

SYN:—Persoon in Ust. Ann. 7. 25. (1794.) Ach. Meth. 57. Nyl. Scand. 208.

FIG:—E. Bot. 1651. Hepp Sporen t. 60. f. 522.

EXS:—Schær. 217. Hepp. 522. Zw. 231.

GEOG. DISTRIB:—Sweden, Germany, Switzerland, Hungary, Bavaria, Austria.

BOT. PROV:—2...5...10...15.

ENGLAND:—New Forest. *Miss Biddulph*. (1806.) near Ripon, Yorkshire. *Mr. Brunton*. near Hastings, Worcester, and Malvern. *Dr. Holl*.

SCOTLAND:—Highlands. *Mr. Turner*.

199. *L. rubella*, (Ehrh.) *yellowish* or *greyish-green*, thin, effuse, *minutely squamuloso-granulate*; *apothecia* *luteo-rufescent* or *reddish-flesh-coloured*, moderate, numerous, scattered or congregate, sessile, plane or convex, margin thin, smooth, obtuse; *hypothecium* *pale-yellow*; spores 8, colourless, bacilliform, multiseptate.

On trees, especially elm, frequent. 1801.

SYN:—Ehrhart Pl. Crypt. 196. (1785.) *Lecidea lutcola*, var. *α* Ach. Syn. 41. Nyl. Scand. 209. *L. porriginosus*, Turn! Linn. Trans. 7. 94.

FIG:—E. Bot. 845. Hepp Sporen t. 16. f. 141.

EXS:—M. & N. 641. Schær. 210. Nyl. 55. Leight. 92. Fries L. S. 197. (fide Nyl.) Anzi Etr. 23. Hepp 141. Bohl. 91.



GEOG. DISTRIB:—Switzerland, France, Hungary, Austria, Italy, Germany, Sweden.

BOT. PROV:—1...3.. 5...10...15...19, 20.. 24...28...30, 31.

ENGLAND:—Ingleby! Kildale! Ayton! Yorkshire. *Mr. Mudd*. Essex! *Mr. Piggott*. Torquay. *Dr. Doukin*. near Malvern, and Kempsey near Worcester. *Dr. Holl*. Haldon, Exeter. *Mr. Parfitt*. Kelvedon; Aldham, Essex. *Mr. Varcane*. Shelton Rough! near Shrewsbury; Worfield! Shropshire.

SCOTLAND:—Aberfeldy. *Dr. Holl*.

IRELAND:—Castlemartyr co. Cork; Carrigogannel and Adare, Limerick. *Mr. Carroll*. Curraghmore, Waterford. *Adam Jones*. Glenarm. *Dr. Moore*. Shanis Castle co. Antrim. *Mr. Wright*.

CHANNEL ISLANDS:—Sark! *Rev. T. Salwey*.

200. *L. bacillifera*, Nyl. *evanescent*; *apothecia black*, small, scattered, plane, margin thickish; *hypothecium thick*, horny, slightly brown; *spores* 8, colourless, *bacilli-form*, 6-septate.

On trees, rare. 1866.

SYN:—Nyl. in Mus. Fenn. 82. (1861.) Scand. 210.

EXS:—Fellm. 172. 173.

GEOG. DISTRIB:—E. Lapland, Sweden, Finland.

BOT. PROV:—7.. 24.

IRELAND:—Kilkee and Ross co. Clare. *Mr. Carroll*.

WALES:—Pennaen pool! near Dolgelley. (1866).

Var. *alpina*, (Hepp.) grey, granuloso-concrescent, diffract; *apothecia black*, internally white or whitish; *hypothecium colourless*; *spores* 3-7-septate, straight.

On mosses and earth among alpine rocks, rare.

SYN:—Hepp fide Stizb. Lecid. nadelf. p. 15. (1863.) Nyl. Lapp. Or. 156.

FIG:—Stizb. l. c. t. 1. f. 2.

GEOG. DISTRIB:—E. Lapland.

BOT. PROV:—15.

SCOTLAND:—Morrone; Craig Guie, Braemar. *Rev. J. M. Crombie*.

201. *L. muscorum*, (Sw.) *cinerascens*, very thin, albido-granulose; *apothecia black*, small, numerous, crowded, plane or sub-convex, margin obliterated; *hypothecium dark-fuscous*; *spores* 8, colourless, *bacilli-form*, 3-7-multi-septate.

On mosses and earth, rare. 1785.

SYN:—Swartz. N. Act. Ups. 4. 245. (1776.) Nyl. Scand. 210.

FIG:—E. Bot. 626. Relh. Fl. Cantab. 124. Nyl. in Bot. Notis. 1852. f. 4.

EXS:—Dicks. 99. Leight. 190. Mudd 152.

GEOG. DISTRIB:—Sweden.

BOT. PROV:—4, 5...7, 8...10...15...19...23.. 31.

ENGLAND:—Gogmagog Hills, Cambridg. *Rev. L. & E. Relhan.* (1785.) Marlock Bath. *Sir J. E. Smith.* Buxton, Norfolk. *Mr. Turner.* Redcar, ! Cleveland. *Mr. Madd.* near Bristol. *Miss Atwood.* Malvern Hills; Bath Hampton Down. *Dr. Holt.*

SCOTLAND:—Blair Athole. *Rev. J. M. Crombie.*

IRELAND:—Middle road near Cork! *Mr. Carroll.* Malahide. *Dr. Carrington.*

WALES:—Llyn Howel! near Barmouth. *Rev. T. Savory.* Cwm Glas! Snowdon; Cader Idris north escarpment!

CHANNEL ISLANDS:—Quenvais, Jersey. *Mr. Lorbalestier.*

202. *L. phaeodes*, (Körb.) *glaucescent, scattered, granulose, effuse; apothecia pale-yellow-flesh-coloured, minute, numerous, scattered, sessile, convex, immarginate; hypothecium colourless; spores 8, colourless, bacilliform, multiseptate.*

On trees, rare.

SYN:—*Bauddin*, Korber Par. 130. (1865.) Crombie En. 73.

EXS:—Anzi Etr. 25. Zw. 340. 339.

GEOG. DISTRIB:—Germany, Italy, Bavaria.

forma *chlorotica*, Ach. pulverulento-granulose, virescent; apothecia pale-yellow.

On trees, rare. 1851.

SYN:—Ach. L. U. 196. (1810.) Crombie En. 73.

GEOG. DISTRIB:—Switzerland.

BOT. PROV:—2...10...19...24... 31.

ENGLAND:—Thirsk! Yorkshire. *Mr. Baker.* (1851). New Forest. *Rev. J. M. Crombie.*

IRELAND:—Dunscombe's Wood, Cork; Muckruss demesne and Island in Upper Lake, Killarney; Castleconnel and Telvoo, Limerick; Killaloe, Clare. *Mr. Carroll.*

CHANNEL ISLANDS:—Noirmont! Jersey. *Mr. Lorbalestier.*

203. *L. effusa*, (Sm.) *yellowish-green, thin, crustaceous, rimose, scurfy; apothecia pale-yellow-flesh-coloured, sessile, small, plane and with thickish margin or plano-convex and immarginate; hypothecium colourless; spores 8, colourless, bacilliform, 7-septate.*

On trees, not common. 1808.

SYN:—Smith! in E. Bot. 1863. (1808).

FIG:—E. Bot. 1863. in part.

EXS:—Arn. 231.

GEOG. DISTRIB:—Bavaria.

BOT. PROV:—2, 3...7...19...31.

ENGLAND:—New Forest! Hants. *Mr. Lyell & Mr. Perce.* (1808.) Kelvedon; Braxted, Essex. *Mr. Varenne.*

IRELAND:—Sunday's Well Weirs, Cork. *Mr. Carroll.*

WALES:—Pen-maen-mawr! Gloddgaeth! Carmarvonshire.

CHANNEL ISLANDS :—Noirmont, Jersey. *Mr. Larbalestier*.

Var. *fuscella*, Fr. apothecia minute, numerous, sessile, convex and conglomerate, fuscescent.

On trees, common.

SYN :—Fr. S. V. S. p. 112. (1846).

EXS :—Leight. 211. Nyl. 135. Zw. 88.

GEOG. DISTRIB :—Sweden, Germany, Bavaria, France.

BOT. PROV :—2, 3...5. 7, 8...10...24...28...31.

ENGLAND :—Sussex ! *Mr. Borrer*. Gopsall ! Leicestershire. *Rev. A. Bloxam*. Airyholme Wood ! Cockshaw ! Stokesley ! Stogdale ! Cliffrigg ! Ingleby Park ; Yorkshire. *Mr. Mudd*. Chelmsford ! *Mr. Piggott*. Felix Hall Park ; Kelvedon, Essex. *Mr. Varenne*. Loppington ! Shropshire.

IRELAND :—Tervoe near Limerick. *Mr. Carroll*. Armagh. *Adm. Jones*.

WALES :—Bryn-y-Maelgwyn ! Conway.

CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier*.

Var. *cæsiopruinosa*, Mudd. apothecia pale-bluish-green colour.

On oaks, rare.

SYN :—Mudd Man. 183. (1861.) *Bacidia cærulea*, Körb. *Biatora Friesiana* B. (Hepp). *Lecidia pollicina*, Nyl.

FIG ;—Hepp Sporen t. 32. f. 288.

EXS :—Leight. 150. Mudd 150. Zw. 88 bis. Arn. 291. Hepp 746.

GEOG. DISTRIB :—Germany, Hungary.

BOT. PROV :—5...10.

ENGLAND :—Stogdale ! Yorkshire. *Mr. Mudd*. (1861.) Pirton, near Worcester. *Dr. Holl*.

Var. *inundata*, (Fries.) tawny-virescent, thin, crustaceous, rimoso-areolate, scurfy ; apothecia pale-brown, minute, numerous, sub-innato-sessile, plano-convex, margin thin ; hypothecium pale ; spores 8, colourless, bacilliform, 7-septate.

On rocks in streams, rare.

SYN :—Fries L. Eur. 261. (1831.) Mudd Man. 183.

EXS :—Mudd 149.

GEOG. DISTRIB :—Europe.

BOT. PROV :—5...10...19.. 31.

ENGLAND :—Airyholme Wood ! Yorkshire. *Mr. Mudd*. Abdon ! Shropshire.

IRELAND :—Sunday's Well Weirs, Cork. *Mr. Carroll*.

CHANNEL ISLANDS :—Noirmont, Jersey. *Mr. Larbalestier*.

204. *L. pelidna*, Ach. nigricant or nigro-virescent, granuloso-leprose, thin, effuse, often evanescent, (K—

C--); apothecia black, plane or convex, small; hypothecium colourless; spores 8, colourless, *vermiformi-cylindrical, spirally curved, 3-5-multiseptate*.

On rocks and stones, frequent. 1854.

SYN:—Ach. L. U. 158. (1810.) *L. umbrina*, Nyl. Scand. 209. *L. vermifera*, Nyl. olim. *L. holomelæna*, Flk.

FIG:—Mudd Man. t. 3. f. 69.

EXS:—Leight. 158. Mudd 153. Zw. 29. 197. Hepp 23. 523. Nyl. 136. Anzi Langob. 117.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1, 2...5...7...10.. 15, 16...(19—30)...31.

ENGLAND:—Kildale! near Ayton; Broughton, Cleveland. *Mr. Mudd*. Penzance! *Rev. T. Salwey*. Sherimanbury, Sussex. *Mr. Lerbalestier*. Hales End, Malvern; near Launceston, Cornwall. *Dr. Holl*. Lyth Hill! (1854.) Wrekin! Haughmond Hill! Llanymynech Hill! Preston on Weald Moors! Shropshire.

SCOTLAND:—Glen Fender, Blair Athole! Coast of Kincardine; Braemar; Appin; Craig Guie; The Khoil. *Rev. J. M. Crombie*.

IRELAND:—On rocks and stones frequent. *Mr. Carroll*.

WALES:—Nant Gwynant! Pass of Llanberis! Snowdon; Penmaen-mawr! Cader Idris!

CHANNEL ISLANDS:—Noirmout; Le Fret Point! Jersey. *Mr. Lerbalestier*.

Var. *turgida*, (Körb.) cinereo-virescent; apothecia turgid, *cephaloid*, flesh-coloured, then fuscous-black; spores multiseptate.

On the ground, rare. 1865.

SYN:—*Scoliciosporum turgidum*, Korb. Par. 241. (1865.) *Crombie* Enum. 74.

GEOG. DISTRIB:—Europe.

BOT. PROV:—24.

IRELAND:—Near Kilkee! co. Clare. *Mr. Carroll*. (1865).

205. *L. pulvinata*, (Tayl.) pale-greenish-brown or cream-coloured, thickish, pulvinate, *granuloso-squamulose*, squamules very minute, congregated and pulvinate; apothecia black, small, concave or plane, margin thick, obtuse, eventually convex and immarginate; hypothecium thick, dark-brownish-black; spores 8, colourless, acicular or sub-clavate, curved, multiseptate; paraphyses conglutinate.

On mosses in alpine places, rare. 1836.

SYN:—Tayl. Fl. Hib. 2. 123. (1836).

GEOG. DISTRIB:—Europe.

BOT. PROV:—7...19.

IRELAND:—Mangerton; Dereenafinchy Mountain co. Kerry. *Dr.*

*Taylor*. (1836.) Brandon Mountain. *Dr. Moore*.  
WALES :—Barmouth!

*H. Spores muriform, fuscous.*

\* *Hypothecium dark.*

206. *L. geographica*, (L.) citrine or bright-yellow, tartareous, continuous, areolato-rimulose, determinate, nigro-limitate, areolae plane; apothecia black, plane, small, scattered or confluent, innate between the areolae; hypothecium black; spores 8, nigrescenti-fuscous, oblong, irregularly murali-ocular.

On mountain rocks, common. 1795.

SYN :—Linn. Sp. Pl. No. 2. (1753.) Ach. Syn. 21. Nyl. Scand. 248.

FIG :—E. Bot. 245. Schær. En. t. 5. f. 3. Hoffm. Pl. Lich. t. 54. f. 2. excl. b. & c.

EXS :—Hepp 152. Anzi It. S. 302. Schær. 172. Mass. 169.

GEOG. DISTRIB :—Switzerland, Italy, Pyrenees, Norway, Scandinavia, Great Bear Lake.

BOT. PROV :—1.. 5.. 7...11...14...18...(19...30)...31.

ENGLAND :—On rocks. *Sir. J. E. Smith*. (1795.) North of England. *Mr. Hudson*. Northumberland and Durham. *Mr. Winch*. Dartmoor. *Mr. Parfitt*. Malvern Hills; Stiperstones, Shropshire. *Mr. Purton*. Devon. *Mr. Holmes*. Haughtmond Hill! Wrekin! Caer Caradoc!

SCOTLAND :—Garrynahine, Lewis. *Dr. Lindsay*. Long Island. *Prof. Balfour*.

IRELAND :—Mountainous districts. *Mr. Carroll*.

WALES :—Barmouth! Moel Siabod! Capel Curig! Conway! Sychnant! near Conway; Crib Goch! Snowdon; Aran Mowddu! Cwm Idwal! Cwm Bochlwyd! Cwm Cywion! Cwm Tryfan! Llyn Cwlyd!

CHANNEL ISLANDS :—Common on all the Islands. *Mr. Lurba-Tostier*.

Var. *cyclopica*, Nyl. bright-yellow, areolae more or less scattered, elevato-convex, each ocellate with an apothecium.

On alpine rocks, rare.

SYN :—Nyl. Scand. 248. (1861.) var. *lecanorina*, Flk. Korb. S. L. G. 263.

FIG :—Hoffm. Pl. Lich. t. 54. fig. b. c.

GEOG. DISTRIB :—Sweden, Finland, Switzerland.

BOT. PROV :—7...15.

SCOTLAND :—Ben Lawers, ! Perthshire. *Dr. Lindsay*.

WALES :—Aberdovey! *Rev. A. Bloom*. Barmouth! Moel y Gofa!

Var. *atrovirens*, (L.) greenish-yellow, areolae plane, more



or less *dispersed*, *hypothallus* black, *conspicuous* and predominating; *apothecia* arising between the areolæ, *confluent*.

On mountain rocks, frequent.

SYN:—Linn. Sp. Pl. No. 7. (1753.) Ach. Syn. 21. Nyl. Scand. 248.

FIG:—Hoffm. Pl. Lich. t. 17. f. 4. Hepp Sporen t. 36. f. 324.

EXS:—Fellm. 203. Hepp 755. Anzi It. S. 303. Mudd 196. Schær. 623. M. & N. 640.

GEOG. DISTRIB:—Vosges, Switzerland, France, Italy, E. Lapland.

BOT. PROV:—5...7...10...15...31.

ENGLAND:—Kildale Moor! Battersby! Cleveland. Mr. Mudd. Oswestry! Rev. T. Salwey. Long Mynd! Caer Caradoc! Shropshire; Stannor Hill! Herefordshire.

SCOTLAND:—Amulree! Perthshire; Birnam Hill! Dunkeld. Dr. Lindsay.

WALES:—Llyn Cae! Cader Idris.

CHANNEL ISLANDS:—Common on all the Islands. Mr. Lerbalestier.

Var. *viridi-atra*, Flk. yellow, verrucoso-areolate, *areolæ tumid*,; *hypothallus* less distinct; *apothecia* protruded between the areolæ, *convex*.

On mountain rocks, frequent.

SYN:—Floerke Deutsche Lich. 4. (1819.) Nyl. Scand. 248.

EXS:—Lindig 163. Zw. 139. Hepp 153. Leight. 93. Anzi It. S. 305.

GEOG. DISTRIB:—Scandinavia, Italy, Switzerland, Germany, Nova Granada.

BOT. PROV:—5.. 10.

ENGLAND:—Burton Head! Cleveland. Mr. Mudd. Haughmond Hill! Long Mynd! Pontesford Hill! Shropshire; Stannor Hill! Herefordshire.

Var. *gerontica*, (Ach.) areolæ albo-sub-pulverulent.

On mountain rocks, rare.

SYN:—Ach. Meth. 45. (1803.) Nyl. Scand. 248.

EXS:—Schær. 624.

GEOG. DISTRIB:—Sweden, Norway, Italy.

BOT. PROV:—5...15.

ENGLAND:—Long Mynd! Shropshire.

SCOTLAND:—"In Scotiæ mediæ alpinis." Rev. J. M. Crombie.

207. *L. petraea*, (Wulf.) *grisco-pallescent* or *cinereo-fuscescent* or *albido-cinerascent*, areolate or granuloso-areolate, areolæ contiguous or dispersed, *convex* or *depressed*, *hypothallus* black, (*K* brownish *C* pale-tawny); *apothecia* black, small, *innato-sessile*, plane, *marginate*.

hypothecium fuscous-black ; spores 8, colourless or fuscous, ellipsoid or oblong, murali-locular.

On granitic and schistose rocks, frequent. 1811.

SYN :—Wulfen in Jacq. Coll. 3. 116. (1789.) Nyl. Scand. 233.

FIG :—E. Bot. 2336. Hepp Sporen t. 6. f. 36. 37. 38.

EXS :—Leight. 159. Mudd 195. Hepp. 36. 37. 38. Zw. 132. T. M. Fries 45.

GEOG. DISTRIB :—Switzerland, Germany, France, Hungary, Sweden.

BOT. PROV :—1, 2...5...7...10, 11...15, 16...18, 19...31.

ENGLAND :—North of England. *Mr. Robertson*. (1811.) Sussex ! Beechy Head ! *Mr. Borrer*. Hampshire ! *Mr. Lyell*. Lonsdale ! Lanbraughrigg ! Cliffrigg ! Cleveland. *Mr. Mudd*. Craigforda ! near Oswestry. *Rev. T. Salwey*. Northumberland and Durham. *Mr. Winch*. Sidmouth ; Haldon, Devon. *Mr. Parfitt*. Lyndhurst Common ; Highbeech ; Epping Forest. *Rev. J. M. Crombie*. Bodbury Ring ! near Church Stretton ; Abdon Burf ! Caer Caradoc ! Bayston Hill ! Lyth Hill ; Haughmond Hill ! Long Mynd ! Laurence Hill ! Shropshire ; Wapley Hill ! Herefordshire.

SCOTLAND :—Garrynahine, Lewis. *Dr. Lindsay*. Callander ; Coast of Kincardine ; near Aberdeen ; Braemar ; Blair Athole ; Breadalbane ; Appin, &c. *Rev. J. M. Crombie*.

IRELAND :—Glengariff ! *Mr. Carroll*.

WALES :—Aberdovey ! *Rev. A. Bloxam*. Barmouth ! Moel-y-Golfa ! Cader Idris ! Pen-maen-mawr !

CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier*.

208. *L. fecunda*, (Th. M. Fr.) *cinereo-virescent*, thickish, effuse, *furfuraceo-concrescent* ; *apothecia black*, sessile, appressed, concave or plane, naked, margin thickish, flexuose ; hypothecium nigro-fuscous ; spores 8, *fuscuscent*, oblong or ellipsoid, muriform.

On old posts &c., rare. 1865.

SYN :—*Lopadium fecundum*, Th. M. Fr. Lich. Arct. 202. (1860).

GEOG. DISTRIB :—Finmark.

BOT. PROV :—5.

ENGLAND :—Maddox Hill ! near Wrekin, Shropshire. (1865).

209. *L. pezizoidea*, Ach. *cinereo-fuscescent*, thin, *sub-squamuloso-concrescent* ; *apothecia fuscous-black*, elevated, somewhat concave, margin thin, inflexed, entire, paler ; *hypothecium brownish-black* ; spores 1, *fuscuscent*, ellipsoid, murali-divided, large.

On mosses in alpine regions, rare. 1861.

SYN :—Ach. L. U. 182. (1810.) Syn. 26. Nyl. Scand. 212. Mudd Man. 190.

FIG :—Hepp Sporen t. 56. f. 482.

Exs :—Zw. 342. Anzi Langob. 142. Hepp 482. Fellm. 167.

GEOG. DISTRIB :—Germany, Lombardy, Hungary, Bavaria, E. Lapland, Norway.

BOT. PROV :—15.

SCOTLAND :—Ben Lawers! *Adm. Jones*. (1861).

210. *L. geminata*, Flot. similar in the structure and variable colour and chemical reaction of the thallus to *L. petraea*, but with spores 1 or 2, fusco-nigrescent, murali-locular.

On quartzose rocks in mountain ranges, rare. 1870.

Possibly only a variety of *L. petraea*.

SYN :—Flotow in litt. in Korb. S. L. G. 259. (1855.) Nyl. Scand.

234. *L. dispersa*, Naëg. MS. in Hepp Exs. 28. (1853).

FIG :—Hepp Sporen t. 5. f. 28.

Exs :—Zw. 199, 200. Hepp 28.

GEOG. DISTRIB :—Scandinavia, France, Switzerland, Hungary, Austria.

BOT. PROV :—15.

SCOTLAND :—Craig Guie, Braemar! *Rev. J. M. Crombie*.

### I. Spores muriform, colourless.

#### \* *Hypothecium* dark.

211. *L. concentrica*, (Dav.) white or greyish-white, very thin, orbicular, determinate, tartareo-farinose, continuous or rimulose, (K—C—); apothecia concentrically arranged, small, imate, black, depressed, margin thick, obtuse; hypothecium central, nigro-fuscous, small: spores 8, colourless, oblong, murali-locular.

On calcareous rocks, frequent. 1794.

Different chemical reaction distinguishes this from *L. petraea*.

SYN :—Davies in Trans. Lin. Soc. 2. 284. (1794.) *L. petraea*, Ach. Syn. 15. Nyl. Scand. 234.

FIG :—E. Bot. 246. Hepp Sporen t. 17. f. 149.

Exs :—Schar. 183. M. & N. 744. Leight. 17. Hepp 149. Anzi It. S. 310.

GEOG. DISTRIB :—Switzerland, Germany, Hungary, Italy, France, Sweden.

BOT. PROV :—1, 2, 3...5 . 7...10...14, 15, 16...19 . 31.

ENGLAND :—Sussex! *Mr. Borrer*. Kildale! Cleveland. *Mr. Muir*. Malvern. *Dr. Holl*. Exeter. *Mr. Parfitt*. Plymouth. *Mr. Holmes*. Whitecliff rocks! Ludlow, Shropshire.

SCOTLAND :—Pentland Hills; Blair Drummond; Appin; Dumblane, Forfarshire; Stonehaven. *Rev. J. M. Crombie*.

IRELAND :—Kilcully! Cork. *Mr. Carroll*.

WALES :—Whitford co. Flint. *Rev. Hugh Davies*. (1794.) Llangollen! Denbighshire; Crib Goch! Snowdon.

CHANNEL ISLANDS :—Jersey ; Guernsey. *Mr. Larbalestier*.

Var. *excentrica*, Ach. *white or greyish-white*, thin, opaque, *rimulose, nigro-limitate or decussate with black lines caused by the confluence of several adjacent thalli*, (K—C—) ; *apothecia innate, scattered ; spores colourless*.

On calcareous rocks, not common. 1800.

SYN :—Ach. Meth. 37. (1803.) Nyl. Scand. 234.

FIG :—Hoffm. Pl. Lich. t. 50. f. 1.

EXS :—Mudd 194.

GEOG. DISTRIB :—Sweden, Germany, Italy, Switzerland.

BOT. PROV :—2...7...10...15, 16...19...30, 31.

ENGLAND :—Sussex ! *Mr. Borrer*. (1800.) Carlton Bank ! Cleveland. *Mr. Mudd*.

SCOTLAND :—Ben Lawers. *Dr. Holl*. Durris and Appin. *Rev. J. M. Crombie*.

IRELAND :—Island Magee, Antrim. *Dr. Moore*. Killarney. *Adm. Jones*.

WALES :—Llyn Aran, Cader Idris ! ; Diganwy ! near Conway ; Crib Goch ! Nant Gwynant ! Snowdon.

CHANNEL ISLANDS :—St. Aubin's Fort ! Jersey. *Mr. Larbalestier*.

212. *L. rimosa*, (Dicks.) *white or bluish-white*, tartareous, *orbicular, determinate, anguloso-rimose in the centre, radiato-rimose towards the circumference*, which is appressed and minutely crenate, (K—C—) ; *apothecia black, more or less cæsio-pruinose, rather large, plane, innato-sessile, margin thick, albo-suffused ; hypothecium thickish, nigro-fuscous ; spores 8, colourless, oblong, murali-locular*.

On calcareous rocks, frequent. 1785.

The *L. calcarius*, Weis. would seem to be a composite species, and as Dickson's name has priority in time over Ramond's *umbilicata*, I have adopted it.

SYN :—Dicks. Br. Crypt. 1. 12. (1785.) *L. calcarius*, Weis. Gott. 40. (1772.) *L. umbilicata*, Ram. Act. Soc. Linn. Paris. 1827. p. 434. *L. petræa var. umbilicata*, Nyl. Prod. 128.

FIG :—E. Bot. 1736 ! Hepp Sporen t. 17. f. 147.

EXS :—Dicks. 24 ! ! ! Hepp 147.

GEOG. DISTRIB :—Switzerland, France, Pyrenees.

BOT. PROV :—5...7...10, 11, 12...15.

ENGLAND :—Yorkshire ! *Mr. Dickson*. (1785.) Heartside Fell between Penrith and Alston, Cumberland ! *Rev. J. Holme*. Craig-y-Rhiw, Oswestry ! *Rev. T. Salwey*. Bed of Wear, ! Durham ! Banks of Tees near Middleton ; *Mr. Robertson*. Carlton, Cleveland. *Mr. Mudd*. Brown Clee Hill ! Shropshire.

SCOTLAND :—Summit of Ben Lawers ! *Mr. Carroll*.

WALES:—Anglesea! *Rev. Hugh Davies*. Eglswg Rocks! Llangollen.

213. *L. concreta*, Wahl. *pallido-fuscescent* or greyish-rufescent, thin, sub-determinate, *minutely areolate*, *areolæ depressed*, (*K pale-yellow C—*); hypothecium nigro-fuscescent, fimbriate; *apothecia nigro-fuscos*, *much larger than the areolæ*, numerous, *innato-sessile*, plane, *margin pallido-fuscescent*, thin, prominent; hypothecium nigro-fuscous, thickish; spores 8, colourless, oblong, ellipsoid, murali-ocular.

On mountain rocks, frequent. 1814.

SYN:—Wahl. Lapp. 471. (1812.) Schær. En. 113. Nyl. Scand. 234.

EXS:—Schær. 117. 180. Zw. 133. Arn. 259. Anzi It. S. 307.

GEOG. DISTRIB:—Europe.

BOT. PROV:—2...5...7...10, 11...19.

ENGLAND:—Near Brighton! Sussex. *Mr. Larbalestier*. Yorkshire! *Mr. Dixon*. Sussex! *Mr. Borrer*. Teesdale. *Mr. Robertson*. (1814.) Haughmond Hill! Long Mynd! Shropshire.

IRELAND:—Musheragh Mount! Kilcully! Cork; Kilmurry, Fermoy! *Mr. Carroll*.

WALES:—Pen-maen-mawr! Cader Idris! Nant Gwynant! Snowdon; Llyn Cae! Cader Idris.

A state of this in which the areolæ are apparently washed by water into a contiguous crust occurs frequently in Wales and Shropshire.

214. *L. plicatilis*, Leight. *dirty-white*, minutely *plicato-verrucoso-granulose*, areolato-diffract, (*K yellow C yellow*); hypothallus fuscous; *apothecia nigro-fuscos*, *large, closely adnate, connato-deformed, undulato-plane*, margin obtuse, undulate, more or less attenuate or obliterated in age; hypothecium thick, nigro-fuscous; spores 4-8, colourless, elongato-ellipsoid, 3-4-5-septate, constricted, murali-divided.

On alpine rocks, rare. 1869.

SYN:—Leight. in Ann. and Mag. N. II. Sept. 1869

GEOG. DISTRIB:—Europe.

BOT. PROV:—7.

WALES:—Llyn Cae! Cader Idris. (1869).

**\*\* *Hypothecium colourless.***

215. *L. fuscolutea*, (Dicks.) *white* or cream-coloured, *granuloso-verrucose*, effuse, (*K yellow, apothecia crimson*); *apothecia dull-yellow*, rather large, *elevato-sessile*, plane, *ochraceo-granuloso-pruinose*, *margin thick, inflexed*, paler,



flexuose; hypothecium pale-yellow; spores 1, colourless, oblong or elliptico-oblong, *murali-reticulate*.

On mosses &c., in alpine districts. rare. 1782.

SYN:—Dicks. Br. Crypt. 2. 18. (1790.) Ach. Syn. 42. Nyl. Prodr. 75.

FIG:—E. Bot. 1007. Dicks. 1. c. t. 6. f. 2.

EXS:—Dicks. 25. Spruce Amaz. 180. Anzi Langob. 94.

GEOG. DISTRIB:—Lombardy, Amazons, Brazils, Mauritius.

BOT. PROV:—11...19.

ENGLAND:—Teesdale, Durham. *Rev. J. Harriman*. Cheviot and Hedgheope, Northumberland. *Mr. Winch*.

SCOTLAND:—Ben Lawers!! *Mr. Dickson*. Breadalbane. *Rev. Mr. Stuart*. (1782.) Ben Cruachan. *Rev. J. M. Crombie*.

216. *L. cupularis*, (Ehrh.) *whitish* or *cinerascent*, very thin, continuous; *apothecia* *flesh-coloured* or *yellowish-reddish*, *superficial*, *prominent*, *concave*, *margin thickish*, *albescent*, entire or radiato-striate; hypothecium colourless; spores 8, colourless, ellipsoid, multiseptate, *murali-ocular*.

On calcareous rocks, frequent. 1800.

SYN:—Ehrhart Beitr. 4. p. 45. (1789.) Ach. Syn. 46. Nyl. Scand. 189.

FIG:—E. Bot. 739. Leight. Ang. Lich. t. 13. f. 1.

EXS:—M. & N. 1153. Schaer. 135. Rabh. 750. Anzi Etr. 22. Anzi It. S. 233. Mudd 139. Leight. 122. Hepp 142. Zw. 282.

GEOG. DISTRIB:—Switzerland, Germany, France, Italy, Bavaria, Pyrenees.

BOT. PROV:—1, 2, 3, 4, 5...7, 8...10.. 15...16...19 ..27...31.

ENGLAND:—Corpusty Church. *Rev. Mr. Bryant*. (1800.) Norfolk. *Sir J. E. Smith*. Penzance. *Mr. Curnow*. Sussex Downs! *Mr. Borrer*. Craig y-Rhiw! near Oswestry. *Rev. T. Salwey*. Calke Park! Derbyshire. *Rev. A. Bloxam*. Broughton Bank! Bilsdale! Cleveland. *Mr. Mudd*. on Elm and Ash, rare, Sussex! *Mr. Borrer*. Fawdon Slate; Bolyhope Bourn; Middleton in Teesdale; Durham. *Mr. Winch*. Midland Counties. *Mr. Purton*. North Leigh and Shotover Hill, Oxford. *Mr. Baxter*. Aymestry! Herefordshire. Whitecliff Rocks! Ludlow; High Rock! Bridgnorth. Shropshire.

SCOTLAND:—Morrone; Appin; on moss, Ben Lawers and Craig Tulloch. *Rev. J. M. Crombie*.

IRELAND:—Balaghbeama Gap, Kerry. *Mr. Carroll*. South of Ireland. *Miss Hutchins*. Killarney. *Dr. Carrington*. Ben Bulbin, Sligo. *Prof. Dickie*.

WALES.—Great Orme's Head! Bryn Maclgwyn! near Conway.

CHANNEL ISLANDS:—L'etacquerel; Gorey Castle; L'Etary! Jersey; Jerbourg, Guernsey. *Mr. Larbalestier*.

217. *L. truncigena*, (Ach.) *cinerascent*, very thin, sub-leprose or evanescent; *apothecia* *pale-reddish-flesh*

coloured, small, urceolate, margin albescent, thickish, entire; hypothecium colourless; spores 8, colourless, oblongo-fusiform or oblong, 5-7-septate, irregularly longitudinally septate.

On trees, frequent.

SYN:—Ach. L. U. 152. (1810.) Syn. 9. Nyl. Scand. 190. 191.

EXS:—Zw. 90. A. B. Leight. 147.

GEOG. DISTRIB:—France, Germany, Switzerland, Sweden.

BOT. PROV:—1, 2...5...10...19...24...31.

ENGLAND:—Ingleby! Cleveland. *Mr. Mudd*. New Forest. *Rev. J. M. Crombie*. Castle Morton Common, Malvern. *Dr. Holl*. Tilgate Forest, Sussex. *Mr. Lorbalestier*. Penzance. *Mr. Curnow*.

IRELAND:—Dunkerron; Derriquin co. Kerry. *Dr. Taylor*. Carraghmore, Waterford. *Adm. Jones*. Castlemary and Kitsboro', Cork; Adare!; Tervoe and Castleconnel, Limerick; Dromoland, Clare; Dinis Island, Killarney (on holly). *Mr. Carroll*.

CHANNEL ISLANDS:—St. John's Road, Jersey. *Mr. Lorbalestier*.

218. *L. Flotorii*, (Körb.) cinerascens, very thin, subleprose or evanescent; apothecia pale-flesh-coloured, small, urceolate, margin albescent, thick, entire; hypothecium colourless; spores 8, colourless, ellipsoid, irregularly sub-murali-divided, small.

On trees, rare. 1800.

SYN:—Nyl. Scand. 191. (1861).

FIG:—Leight. Ang. Lich. t. 13. f. 3. Hepp Sporen t. 86, f. 749.

EXS:—Mudd 140. Hepp 749. Zw. 393. Arn. 94.

GEOG. DISTRIB:—France, Bavaria, Germany.

BOT. PROV:—1, 2...5...10...24...26.

ENGLAND:—On Elms and Ash, Sussex! *Mr. Borrer*. (1800.) Bilsdale! Ingleby! Yorkshire. *Mr. Mudd*. Leigh Woods, Clifton! *Mr. Lorbalestier*. near Exeter. *Rev. J. M. Crombie*.

IRELAND:—Carraghmore. *Adm. Jones*. Castleconnel co. Limerick. *Mr. Carroll*.

### K. *Species polysporæ*.

219. *L. morio*, (Ram.) yellowish-copper-coloured or fusco-cinerascens, areolate, areolar plane, somewhat shining, angular, radiato-plicate at the circumference, (K yellow C red); hypothecium black; apothecia black, small, innate, plane, often umbonate, margin thin, black, flexuose; hypothecium brown; spores innumerable, very minute, colourless, spherical or shortly ellipsoid, simple.

On alpine rocks, rare.

SYN :—Ramond in DC. Fl. Franc. 2. 366. (1805). Nyl. Scand. 290.

FIG :—Hepp Sporen t. 69. f. 603.

EXS :—Schær. 227. Anzi Langob. 164. Hepp 603.

GEOG. DISTRIB :—Switzerland, Lombardy, Pyrenees, Norway, Finmark, Austria.

BOT. PROV :—7...10.. 15.

ENGLAND :—Thirsk, Yorkshire. *Mr. Baker.*

SCOTLAND :—Morrone, Braemar. *Rev. J. M. Crombie.*

WALES :—Near Dolgelley. *Dr. Holl.*

220. *L. tantilla*, Nyl. *cinereo-virescent*, tartareous, *scurfy*; *apothecia fuscous or nigro-fuscous*, small, scattered, *sessile, convex, immarginate*; *hypothecium colourless*; spores innumerable, colourless, sphaerical, simple.

On old palings, rare. 1865.

SYN :—Nyl. Prodr. 117. (1857.) *B. resinæ var. rubicundula*, Mudd Man. 191.

EXS :—Leight. inedit. 408. 411.

GEOG. DISTRIB :—France, Bavaria.

BOT. PROV :—3...5...10.

ENGLAND :—Redcar, Yorkshire. *Mr. Mudd.* Hendon! Middlesex. *Rev. J. M. Crombie.* near Worcester. *Dr. Holl.* Stableford! near Bridgnorth, (1865.) Brace Meole! Bomere Pool! near Shrewsbury; Wilcot! Shropshire.

221. *L. resinæ*, Fr. *cinereo-virescent*, thin, effuse, *scurfy or granulose*; *apothecia pale-yellowish-brown*, small, numerous, *innato-sessile, convex, margin thin, pale*; *hypothecium pale*; spores innumerable, colourless, sphaerical, simple.

On old trees, rare. 1854.

SYN :—Fries Syst. Mycol. 2. 149. (1822.) Nyl. Scand. 213. Mudd Man. 191.

EXS :—Leight. 277.

GEOG. DISTRIB :—Scandinavia.

BOT. PROV :—10.

ENGLAND :—Cliffrigg! Yorkshire. *Mr. Mudd.* (1854).

222. *L. ochrophora*, Nyl. *obsolete*; *apothecia ochraceo-suffused, pulverulent*, small, convex or at length subglobose, *immarginate, dusky-pallescent within*; spores numerous, colourless, sphaerical; paraphyses slender or indistinct, a thin lamina of the apothecia entirely amber-colour; *gelatina hymenea cærulescent with iodine.*

On trees in sub-alpine woods, rare. 1865.

SYN :—Nyl. in Flora 1865. p. 355. Crombie En. 75.

GEOG. DISTRIB :—France.

BOT. PROV :—19.. 31.

IRELAND :—Dinis in Killarney. *Mr. Carroll.*

CHANNEL ISLANDS :—Rozel, Jersey. *Mr. Larbalestier.*

223. *L. ascaridiella*, Nyl. *whitish*, thin, opaque, *rimulose*, determinate; apothecia *nigricant*, *innate*, most minute, *colourless within*, margin pseudo-thallodal, *crenulate*; spores 16-32, colourless, *vermiform*, apically acute, once or twice torto-curved, simple; paraphyses very slender, large; epithecium slightly fuscous; hypothecium colourless; gelatina hymenea untinged with iodine.

On sandstone rocks in sub-alpine regions, rare. 1868.

Belonging to the *Gyalectæ* near *L. leucaspis*, (Kphb).

SYN :—Nyl. in Flora 1868. p. 163. Crombie En. 75.

GEOG. DISTRIB :—Europe.

BOT. PROV :—19.

IRELAND :—Mangerton and adjacent Mountains in Kerry. *Mr. Carroll.*

### *L. Parasitical Species.*

224. *L. vitellinaria*, Nyl. no proper thallus; apothecia parasitic, *black*, *very minute*, scattered, sessile, concave, margin elevated, polished; hypothecium brownish; spores 8, colourless, *elliptical or oblong*, simple, with 1 or 2 nuclei (in size and form exactly like those of *Lecidea parasema*.)

Parasitic on *Lecanora vitellina*, not common. 1851.

SYN :—Nyl. in Bot. Not. 1852. p. 177. Scand. 218

EXS :—Leight. 182. Arn. 193.

GEOG. DISTRIB :—Sweden, Austria, Germany.

BOT. PROV :—5...10...15.

ENGLAND :—Near Newton! Langbraugh-rigg and Battersby, Yorkshire. *Mr. Mudd.* Black Mountain, Monmouthshire. *Dr. Holl.* Haughmond Hill! Shropshire. (1851).

SCOTLAND :—Breadalbane; Ben Lawers. *Rev J. M. Crombie.*

225. *L. oxyspora*, (Tul.) no proper thallus; apothecia parasitic, *black or fuscous-black*, minute, plane or sub-convex, immarginate; hypothecium fuscous; spores 8, colourless, *elliptical*, simple, with 2 nuclei.

Parasitic on various Parmeliei in sub-alpine regions. rare. 1856.

SYN :—Tul. Mem. 116. (1852.) Nyl. Scand. 246.

FIG :—Microscop. Journ. 5. t. 4. fig. 15. 16.

GEOG. DISTRIB :—Scandinavia.

BOT. PROV :—7...15.

SCOTLAND :—Glen Shee ! (1856). Mowenoff Hill ! Perth : Strathbraan ! Dunkeld ; Corramulzie, Braemar ; *Dr. Lindsay*.

WALES :—Barmouth !

226. *L. leptostigma*, Nyl. parasitic on a whitish rimulose thallus, apothecia *fusco-nigricant*, plane, *innate*, *small*, *gregarious* ; spores 8, *colourless*, *globose*, or *globoso-ellipsoid* ; paraphyses moderate, thickened upwards and dirty-yellow at the apices ; hypothecium scarcely lutescent ; gelatina hymenea not tinged with iodine.

On micaceo-schistose rocks, rare. 1868.

SYN :—Nyl. in Flora 1868. p. 344. Crombie En. 76.

GEOG. DISTRIB :—Europe.

BOT. PROV :—15.

SCOTLAND :—Ben Lawers. *Rev. J. M. Crombie*.

227. *L. episema*, Nyl. no proper thallus ; apothecia parasitic, *black*, *aggregate*, *minute*, margin obtuse, entire ; hypothecium fuscous ; spores 8, *colourless*, *ellipsoid* or *elongato-oblong*, 1-septate.

Parasitic on *Lecanora calcarea*, not common. 1851.

SYN :—Nyl. Coll. Gall. m. Pyr. p. 12. (1853.) Prodr. 125.

GEOG. DISTRIB :—France.

BOT. PROV :—7...19.

IRELAND :—Kenmare Bay near Dunkerron. *Dr. Taylor*.

WALES :—Great Orme's Head ! (1851).

228. *L. cristata*, Leight. no proper thallus ; apothecia parasitic, *black*, very minute, *solitary* or more generally *clustered*, or in *narrow flexuose lines* like a hypothallus, *concave*, *margin thick and obtuse* ; hypothecium *black*, carbonaceous ; spores 8, *colourless*, *lineari-oblong*, faintly 1-septate, very minute.

Parasitic on the thallus of *Lecanora sub-carnea*, rare. 1856.

GEOG. DISTRIB :—Europe.

BOT. PROV :—7.

WALES :—Barmouth ! (1856).

229. *L. arenicola*, Nyl. thallus none ; apothecia parasitic on thallus of *Baeomyces rufus* and *roseus*, minute, *black*, sessile, *solitary*, *concave* or plane, margin thick, obtuse, *slightly inflexed and polished* ; hypothecium dark-brown ; spores 4, *colourless*, slender, *elongato-acicular*, *multiseptate*, cells containing oily globules.

Parasitic as above, rare. 1854.



SYN :—Nyl. in litt. 1853. Mudd Man. 186. (1861).

EXS :—Leight. 372.

GEOG. DISTRIB :—France.

BOT. PROV :—5...7, 8...10...15.

ENGLAND :—Guisbro' Moor! Loundsdale; Ingleby Moor, Cleveland. *Mr. Mudd.* (1854.) Goit Lane, Buxton. *Dr. Holl.* Wapley Hill! Herefordshire; Stiperstones! Shropshire.

SCOTLAND :—Ben Lawers. *Dr. Holl.*

WALES :—Cader Idris. *Dr. Holl.*

230. *L. Parmeliarum*, Smrf. thallus none; *apothecia* parasitic, black or greenish, pruinose or naked, sub-innato sessile, *convex, immarginate*; hypothecium greenish-brown; spores 8, fuscous, oblong, 1-septate.

Parasitic on the thallus of various *Parmeliei* in sub-alpine regions, frequent.

SYN :—Smrf. Lapp. 176. (1826.) *Abrothallus Smithii* & *Wetwitschii*, Tul. Mem. Lich. 113. 115. Mudd Man. 224.

FIG :—E. Bot. 1866. Microscop. Journ. 5. t. 4. fig. 1—14.

EXS :—Arn. 319. Anzi Langob. 230, Mudd 201. Zw. 231. Leight. 191. 309. 310.

GEOG. DISTRIB :—Germany, Lombardy, Lapland, Austria, Sweden, Italy.

BOT. PROV :—1...5, 6, 7...10...13...15.. 19...31.

ENGLAND :—Meadfoot! Torquay. *Dr. Deakin.* Ingleby Park! Cleveland. *Mr. Mudd.* Pembridge! Herefordshire. *Rev. J. P. Crouch.* Dartmoor; Malvern Hill; Meadfoot, Torquay, and near Bovey Tracy, S. Devon. *Dr. Holl.*

SCOTLAND :—Ben Nevis. *Messrs. Turner & Hooker.* Craigie Hill! Perth; Craig-y-Barnes; Strathbraan Road, Dunkeld; between Dunfries and Caerlaverock! *Dr. Lindsay.* Aberdeenshire! *Prof. Dickie.* Crianlarich. *Dr. Holl.* Countess Wells; Braemar; Craig Calliach; Trosachs. *Rev. J. M. Crombie.*

IRELAND :—Mangerton co. Kerry. *Dr. Taylor.*

WALES :—North Wales. *Mr. Griffith.* (1800.) Cribbath Hill near Ystrad Gynlais, S. Wales. *Mr. Sowerby.* Llyn Aran! Cader Idris; Moel-y-Golfa! Barmouth! between Bala and Dolgelley! near Capel Curig! Llyn Cwlyd!

CHANNEL ISLANDS :—Jerboung Cliffs! Guernsey. *Mr. Larchester.*

231. *L. parasitica*, (Flk.) no proper thallus; *apothecia* parasitic, black, scattered or aggregate, *concave or plane, sessile*, margin thin, elevated, entire, polished; hypothecium dark reddish brown; spores 8, fuscous, linear-oblong, 3-septate, small.

Parasitic on the thallus of *Pertusaria communis* and *Lecanora parella*, frequent.

SYN :—Florke D. L. 101. (1821.) Nyl. Prodr. 144. *Lecidea dispersa*, Tul.

EXS :—Leight. 183. Larbal. 86. Nyl. 68.

GEOG. DISTRIB :—France, Switzerland, New Zealand, Great Bear Lake.

BOT. PROV :—1, 2...5...7, 8. 10. 19..24...26...31.

ENGLAND :—Randiddles ! Hants. *Mr. Borrer*. Cliffriegg ! Easby Wood, Cleveland. *Mr. Mudd*, near Exeter, Devonshire. *Mr. Parfitt*, New Forest. *Rev. J. M. Crombie*, near Twycross, Leicestershire. *Rev. A. Bloxam*, Hale's End, Malvern ; S. Devon and Cornwall ; Fairlight near Hastings. *Dr. Holl*, Plymouth. *Mr. Holmes*, Wapley Hill ! Herefordshire.

IRELAND :—Blarney and Riverstown, Cork. *Mr. Carroll*. Curraghmore. *Adm. Jones*.

WALES :—Barmouth ! *Rev. T. Salwey*.

CHANNEL ISLANDS :—La Moye and St. Peter's Barracks ! Jersey. *Mr. Larbalestier*.

232. *L. scapanaria*, Carringt. thallus none ; apothecia parasitic, minute, sparingly scattered, coarctate when young, explanate when mature or old, dull-reddish-black, plane, margin elevated, somewhat tumid ; hypothecium thin, dark-yellowish-brown ; spores 6-8, fuscous, obtusely fusiform, straight or slightly curved, 3-septate.

Parasitic on *Scapanaria undulata*, rare 1861.

SYN :—Carrington Irish Crypt. 2. in Trans. Bot. Soc. Edin. 7. pt. 2. p. 384. and pt. 3. 411. (1861).

FIG :—Trans. Bot. Soc. Edin. 7. t. 10. f. 4.

GEOG. DISTRIB :—Europe.

BOT. PROV :—19.

IRELAND :—Cromaglow, Killarney. *Dr. Carrington*. (1861).

233. *L. Cladoniaria*, Nyl. thallus none ; apothecia parasitic, black, sub-convex, sub-immersed, internally black ; spores 8, colourless, oblong, simple.

Parasitic on *Cladonia bellidiflora*, rare. 1861.

SYN :—Nyl. Enum. Sup. 339. (1857.) Crombie En. 94.

GEOG. DISTRIB :—Europe.

BOT. PROV :—23.

IRELAND :—Kelly's Glen near Dublin. *Dr. Moore*. (1861).

## II. ODONTOTREMA. Nyl.

Thallus indistinct. Apothecia black, thelotremoideo-lectideine or gymnotremoid, naked, at first closed, then dehiscing with denticulato-ruptured proper margin.

1. *O. longius*, Nyl thallus whitish or albidocinerascent, effuse ; apothecia black, scattered, small,

*rotundate or oblong, margin thin, flexuose or unequal, eventually obliterated*; hypothecium thin, nigro-fuscous; paraphyses distinct; spores 8, colourless, ellipsoid-fusiform, obtuse at the apices, 3-septate.

On old rails, rare. 1867.

SYN:—Nyl. in litt. 1867. Crombie En. 95.

EXS:—Leight. 409.

GEOG. DISTRIB:—Europe.

BOT. PROV:—5.

ENGLAND:—Brace Meole! near Shrewsbury! Shropshire. (1867).

### III. SCHIZOXYLON, *Pers.*

Thallus evanescent. Apothecia lecideine, elevated, naked, black. Spores numerous.

1. *Schizoxylon corticola*, (Frs.) Nyl. *whitish or yellowish-white*, thin, continuous, tartareous, smoothish; apothecia black, very numerous, round, plano-convex, *sub-pulverulent or minutely granulose, immarginate*; hypothecium thin, dark-brown; paraphyses slender, distinct; spores innumerable, colourless, very minute, oblong, simple.

On old oaks, rare. 1870.

SYN:—Nyl. Class. 2. p. 197. (1855.) Enum. gen. 127. Scand. 249. *Coniangium*, Fr. S. V. So. 121.

EXS:—Fr. 273. (fide Nyl).

GEOG. DISTRIB:—Europe.

BOT. PROV:—2.

ENGLAND:—Near Lyndhurst in New Forest! *Rev. J. M. Crombie.*

### IV. AGYRIUM, *Fr.* in part, *Nyl.*

Thallus scarcely visible. Apothecia oblong or rotundate, epithecium plane or convex. Paraphyses indistinct.

1. *A. rufum*, (Pers.) thallus indicated by a whitish spot; apothecia bright-red, rotundate or oblong, pale or convex, prominent, *sub-tuberculose*; hypothecium pale; spores 8, colourless or rufescent, ellipsoid, simple.

On old posts &c., rare.

SYN:—*Stictis rufa*, Pers. Obs. Myc. 2. p. 74. (1799.) *Agyrium*, Fr. S. M. 2. 232. Nyl. Scand. 250.

FIG:—Pers. Obs. Myc. t. 6. f. 6.

EXS:—Fellm. 206. M. & N. 1096.

GEOG. DISTRIB:—Scandinavia, Switzerland, France.

BOT. PROV:—19.

IRELAND:—Crogham! Killarney. *Messrs. Wright & Carroll.*  
Dinis, Killarney. *Mr. Carroll.*

## TRIBE XVI. GRAPHIDEI.

Thallus thin, scarcely visible or hypophlæodal. Apothecia lirelline.

### I. LITHOGRAPHIA, *Nyl.*

Thallus crustaceous or evanescent; apothecia lirellæform, black, tumid, epithecium rimiform, margins thick, convex; hypothecium black, thick, entire; spores 8 or numerous, simple or 1-septate.

1. *L. tesserata*, (DC.) *pale-brownish-grey*, crustaceous, *tessellato-areolate*, areolæ plano-convex, (K yellow then red); *apothecia fuscous-black*, lirellæform, slightly prominent, short, obtuse, simple or slightly divided, *solitary or clustered*, straight or curved; *epithecium rimiform*; *margin thick, inflexed*; hypothecium thick, black; spores 8, colourless, oblong or ellipsoid, simple, minute.

On alpine rocks, rare.

SYN:—*Opegrapha tesserata*, DC. Fl. Fr. 2. 313. (1805). Leight. Br. Graphid. p. 8. *Opegrapha petraea*, Ach. Syn. 72. *Lithographa tesserata*, *Nyl. Scand.* 290.

FIG:—E. Bot. Suppl. 2632. fig. 2. Leight. Br. Graph. t. 5. f. 1.

EXS:—Leight. 396. Anzi Langob. 203. Th. M. Fries 46. Körb. 256.

GEOG. DISTRIB:—Sweden, Italy.

BOT. PROV:—1...7...10, 11, 12...15.

ENGLAND:—Holwick Sear, on the Tees, Yorkshire! *Mr. Robertson.* Valley of Rocks, Linton, N. Devon! *Mr. Borrer.* Middleton in Teesdale, Durham! *Rev. J. Harriman.* near Staveley. *Mr. Martindale.*

SCOTLAND:—Morrone; Ben Lawers. *Rev. J. M. Crombie.*

WALES:—Cader Idris, north west side! Llyn Aran! Llyn Cae! Cader Idris; Aran Mowddu! Cwm Cywion! Glyder Vach. Pass of Llanberis!

2. *L. petraea*, (Durieu.) *evanescent*; *apothecia black*, lirellæform, thick, *linear, simple*, somewhat shining, *clustered and congregated*, flexuose; epithecium rimiform; *margin very thick, tumid, inflexed*; hypothecium thick, black; spores numerous, colourless, oblongo-cylindrical, simple.

On rocks, rare.

SYN:—Mont. & Dur. Expl. Sc. Alger. 278. (1846.) Nyl. Prodr. 147.

EXS:—Larbal. 40.

GEOG. DISTRIB:—Algeria.

BOT. PROV:—31.

CHANNEL ISLANDS:—Le Fret Common!; Noirmont! Jersey.  
Mr. *Lartalestier*.

3. *L. dendrographa*, Nyl. cinerascens, effuse or evanescent, (K—C—); apothecia black, linear or oblong or elliptical, simple or slightly furcato-divided, erumpent; epithecium black, opaque, narrow, at length applanate, margin prominent, thin, shining, more or less flexuose; hypothecium fuscous-black; spores numerous, colourless, ellipsoid, minute, simple; paraphyses indistinct.

On trees, rare. 1869.

SYN:—Nyl. in Flora 1864. p. 488. Crombie Enum. 95.

GEOG. DISTRIB:—France.

BOT. PROV:—1.

ENGLAND:—Near Totnes. S. Devon! Dr. *Holl*. (1869).

4. *L. cerebrina*, Schær. chalky-white, tartareous, contiguous, (K—C—); apothecia scattered or congregate, sessile, variously plicato-deformed, black; hypothecium black, thick; spores 8, fuliginous or nigricant, lineari-oblong, 1-septate.

On calcareous rocks, rare.

SYN:—Schær. Spic. 136. 196. (1823—1836). Nyl. Prodr. 140.

*Opographa*, DC. Leight. Br. Graph. 8.

FIG:—E. Bot. Suppl. 2632. fig. 1. (1830.) Leight. Br. Graph. t. 5. f. 2.

EXS:—Arn. 133.

GEOG. DISTRIB:—Bavaria, Italy, Pyrenees, France.

BOT. PROV:—1...8...10, 11, 12.

ENGLAND:—Northern Counties. Mr. *Dickson*. Teesdale! Durham. Rev. J. *Harriman*. Ingleborough. Dr. *Carrington*. Penhill. Mr. *Baker*. Matlock co. Derby. Dr. *Holl*. Dartmouth. Mr. *Parfitt*.

5. *L. interjecta*, Leight. albido-subvirescent, tartareous, thin, furfuraceous, almost evanescent; apothecia black, lirelliform, somewhat shining, linear, simple or sometimes branched, solitary or clustered, flexuose; epithecium very narrow, rimiform; margin tumid, inflexed; hypothecium black; spores 8, colourless, oblong, 1-septate.

On slaty maritime rocks, very rare. 1856.

BOT. PROV:—7.

WALES:—Barmouth! (1856).



II. XYLOGRAPHA, *Fr. pr. p. Nyl.*

Apothecia linear, epithecium plane or concave or sulciform, longitudinally plicate. Spores colourless. Paraphyses distinct or indistinct, slender.

1. *X. parallela*, (Ach.) thallus an elongated whitish spot; apothecia black, narrowly lanceolato-linear, erumpent, innate, plane or somewhat concave, parallel, internally cinerascens; spores 8, colourless, ellipsoid, simple; paraphyses distinct, slender.

On old wooden posts, &c. rare.

SYN:—Nyl. Scand. 250. (1861.) Crombie En. 95. *Opegrapha parallela*, Ach. L. U. 253. (1810).

EXS:—M. & N. 656. Fellm. 205. Körb. 257. Anzi Langob. 346. Arn. 244.

GEOG. DISTRIB:—Belgium, Switzerland, Bavaria, Austria, Hungary, Italy, E. Lapland.

BOT. PROV:—15.

SCOTLAND:—Glenfalloch! *Dr. Holl.* Pass of Killiecrankie; Glen Dee, Braemar. *Rev. J. M. Crombie.*

III. GRAPHIS, *Ach. Nyl.*

Thallus thin, epiphylæodal or hypophylæodal. Apothecia (lirellæ) black, linear, variously divided or simple, innate or immersed at the base. Perithecium black, lateral or entire. Spores colourless or fuscous, plurilocular, coloured blue by iodine. Gelatina hymenea untinged by iodine. Paraphyses slender, distinct.

A. *Spores lineari-elongate or cylindrical, with many transversely oval cells.*

1. *G. elegans*, (Sm.) pale-cream-colour or greyish-white, thin, membranaceous, granulate or rugose; lirellæ erumpent, prominent, sessile, oblong or lineari-elongate, simple, straight or curved; perithecium dimidiate or lateral, palmatifid; epithecium rimæform, closed; proper margin thick, tumid, prominent, longitudinally furrowed; spores 8, colourless, enveloped in a hyaline membrane, lineari-elongate or cylindrical, with 11-13 transversely oval cells.

On trees, finest on holly, common. 1807.

SYN:—Sm. E. Bot. 1812. (1807.) Ach. Syn. 85. Nyl. Prod. 151. *Aulacographa elegans*, Leight. Br. Graph. 45.

FIG :—E. Bot. t. 1812. Leight. Br. Graph. t. 7. f. 26.

EXS :—Schar. 515. Leight. 68. M. & N. 360. Nyl. 69. Mudd 223. Hepp 552. Korb. 286. Bohl. 27.

GEOG. DISTRIB :—Europe, France, Switzerland, Germany, Asia, America.

BOT. PROV :—1, 2, 3...5.. 7, 8...10...15...19.

ENGLAND :—Sussex ! *Mr. Borrer*. (1807.) Oxfordshire ! *Mr. Baxter in hb. Greville*. Crafnant ! Shropshire. *Rev. T. Salwey*. Bardon Hill ! Gracedieu ! Leicestershire. *Rev. A. Blount*. St. Leonard's Forest ! Sussex ; Tunbridge Wells ! *Mr. Thompson*. near Exeter ; New Forest. *Rev. J. M. Crombie*. Berrow Wood ! and Holly Bush Hill ! Malvern Hills. *Mr. Lees*. Thorndon Park, Essex ! *Mr. Piggott*. Baysdale ! Yorkshire. *Mr. Mudd*. Great Ayton ! Yorkshire. *Mr. Dixon*. Pembridge ! Herefordshire. *Rev. J. F. Crouch*. Midsummer Hill, Malvern. *Dr. Holl*. Haldon, Devon. *Mr. Purfitt*. Haughmond Hill ! Nosscliffe Hill ! Shropshire.

SCOTLAND :—West Highlands near Inverary ; in Lorn at Bunawe. *Rev. J. M. Crombie*.

IRELAND :—Riverstone ! and Ballymartle ! co. Cork ; Killarney ! *Mr. Carroll*.

WALES :—Abertygwyn, Dolgelley. *Dr. Holl*. Gloddach ! near Conway ; Torrent Walk ! near Dolgelley ! Woods opposite Tanybwch Hotel ! near Capel Curig.

2. *G. scripta*, Ach. cream-coloured or greyish white, thin, membranaceous or sub-tartareous, continuous, even or rugose ; *lirellæ immersed*, slender, of the same width throughout, extremities obtuse, proper margin narrow, elevated, wavy and crisped ; thallodal margin elevated, tumid ; *epithecium canaliculate*, naked or pruinose ; perithecium dimidiate or lateral ; spores 8, colourless, elongato-linear or cylindrical, apically rounded, containing 8-10 transversely oval margined cells.

On trees, frequent and very variable.

SYN :—Ach. l. U. 265. (1810.) Syn. 81. Nyl. Scand. 251. *G. serpentina*, Leight. Br. Graph. 32.

FIG :—Leight. Br. Graph. t. 6. f. 19.

GEOG. DISTRIB :—Throughout the World.

BOT. PROV :—2, 3.. 5.. 7, 8...10...13...15...19...30, 31.

*forma minuta*, Leight. *thallus fusco-nigro-limitate* ; *lirellæ very short and simple*, straight ; *epithecium rimæ* form or slightly canaliculate, naked or slightly pruinose ; proper margin thickish, flexuose, uniform. (Leight. Br. Graph. p. 32.)

ENGLAND :—Sussex ! *Mr. Borrer*. Crafnant near Oswestry. Shropshire ! *Rev. T. Salwey*. Epping Forest ; St. Leonard's Forest. *Rev. J. M. Crombie*.

forma *diffusa*, Leight. pale-olive, fusco-nigro-limitate or sub-effuse ; *lirellæ elongated, simple, curved, distantly scattered* ; epithecium rimæform, plane, naked ; proper margin narrow, curved, flexuose, crisped. (Leight. Br. Graph. p. 33.)

ENGLAND :—Charlton Forest ! Sussex. *Mr. Borrer*. Haldon Woods, Exeter. *Mr. Parfitt*.

IRELAND :—Derriquin ! *Dr. Taylor*. Colin Glen, Belfast ! *Mr. Thompson*.

WALES :—Woods near Capel Curig !

forma *varia*, Leight. pale-yellow, fusco-nigro-limitate ; *lirellæ elongated, immersed, very various in shape, size, and disposition, rather crowded, simple or branched or furcate, straight or wavy* ; epithecium rimæform or slightly canaliculate, sub-pruinose ; proper margin thin, flexuose and crisped. (Leight. Br. Graph. p. 33.)

ENGLAND :—Sussex ! *Mr. Borrer*. near Little Malvern ! Worcestershire. *Mr. Lees*. Gopsal ! Leicestershire. *Rev. A. Bloxam*. Essex ! *Mr. Piggot*.

WALES :—Woods near Capel Curig !

CHANNEL ISLANDS :—St. Owen's Manor Avenue ! St. Peter's Valley ! and Beaumont ! Jersey. *Mr. Larbalestier*.

forma *flexuosa*, Leight. pale-yellow, fusco-nigro-limitate ; *lirellæ very elongated and slender, flexuose, simple, immersed* ; epithecium rimæform, very narrow, pruinose ; proper margin thin, elevated, flexuose and crisped. (Leight. Br. Graph. p. 34. Zw. 304.)

ENGLAND :—Sussex ! *Mr. Borrer*. Kelvedon, Essex. *Mr. Varenne*.

IRELAND :—Castlebernard Park ! Cork. *Prof. Hincks*.

WALES :—Woods near Capel Curig !

CHANNEL ISLANDS :—Common on all the larger Islands. *Mr. Larbalestier*.

forma *horizontalis*, Leight. whitish-yellow, fusco-nigro-limitate ; *lirellæ crowded, very long and slender, disposed horizontally, wavy, simple or furcate or crooked, immersed* ; epithecium rimæform, exceedingly narrow, naked ; proper margin slender, elevated, flexuose and crisped. (Leight. Br. Graph. 34. Exs. 244, Anzi It. S. 344. Mudd. 217.)

ENGLAND :—Sussex ! *Mr. Borrer*. Holly Bush Hill, Malvern range, Worcestershire ! *Mr. Lees*. Bousdale Gill, Cleveland ! *Mr. Mudd*. Kelvedon, Essex. *Mr. Varenne*. New Forest. *Rev. J. M. Crombie*. Abdon ! Shropshire. '

SCOTLAND :—Near Stirling. *Rev. J. M. Crombie.*

forma *divaricata*, Leight. pale-yellow, effuse ; *lirellæ* short and straight, with a central branch divaricate or at right angles ; epithecium narrow and canaliculate, pruinose ; proper margin thickish, entire, flexuose. (Leight. Br. Graph. 35. Exs. 21. 19. Hepp 535. Larbal. 88. Anzi It. S. 341).

ENGLAND :—Sussex ! *Mr. Borrer.* Tunbridge Wells ! *Mr. Thompson.* Oxfordshire ! *Mr. Baster.* Cliffrigg ! *Mr. Mudd.* Abdon ! Shropshire.

SCOTLAND —Knockdolian ! Ayrshire ; Rammerscales ! Dumfriesshire. *Mr. Thompson.*

IRELAND :—Colin Glen, Belfast !, Bangor !, Tullamore Park ! co. Down. *Mr. Thompson.*

WALES :—Gloddeath ! near Conway, Caernarvonshire ; Woods near Capel Curig !

CHANNEL ISLANDS :—St. Lawrence Road ! Beaumont ! Rozel ! Jersey. *Mr. Larbalcestier.*

forma *recta*, (Humb.) pale-yellow or straw-colour, in horizontally elongated patches, nigro-limitate ; *lirellæ* very numerous, elongated, narrow, simple, horizontal and parallel, acuminate and sharply pointed at the extremities ; epithecium canaliculate, naked or sub-pruinose ; proper margin thick, elevated, uniform. (Leight. Br. Graph. 38. t. 6. f. 20. Zw. 306. E. Bot. t. 2301. Hepp 46. 888. Anzi Ital. S. 343).

ENGLAND :—Sussex ! *Mr. Borrer.* Ingleby Park ! Easby Wood ; Baysdale, Cleveland. *Mr. Mudd.* New Forest, *Rev. J. M. Crombie.*

SCOTLAND :—Near Stirling. *Rev. J. M. Crombie.*

forma *stellata*, Leight. pale-olive, fusco-nigro-limitate ; *lirellæ* stellate, distant, few, scattered, rays simple, acute ; epithecium canaliculate, naked ; proper margin thick, uniform. (Leight. Br. Graph. 36).

ENGLAND :—Sussex ! *Mr. Borrer.* Airyholme Wood ; Hoggarts Wood ; Ingleby Park, Cleveland. *Mr. Mudd.*

Var. *serpentina*, Ach. white and cinereous, thickish, tartareous, pulverulent, cracked, determinate ; *lirellæ* immersed, elongated, crowded, flexuose, simple or branched, obtuse, cæsio-pruinose ; epithecium at length plane ; proper margin thin, elevated ; thallodal margin lateral, incrassate ; spores as above.

On trees, frequent.

SYN :—Ach. L. U. 269. (1810.) Syn. 83. Nyl. Scand. 252. Prodr. 149. *Gr. diffracta*, Leight. Br. Graph. 39.

FIG :—Leight. Br. Graph. t. 6. f. 21.

EXS :—Mudd 221. 222.

GEOG. DISTRIB :—Europe, America.

ENGLAND :—Tilgate Forest! Sussex. *Mr. Borrer*. near Little Malvern! Worcestershire. *Mr. Lees*. Airyholme. Wood! Cleveland. *Mr. Mudd*. New Forest! Hants. *Mr. Lyell*. Penzance! *Rev. F. Salwey*. Devon. *Mr. Parfitt*. New Forest; Epping Forest. *Rev. J. M. Crombie*. Abdon! Nesscliffe Hill! Shropshire.

SCOTLAND :—Falls of Clyde; near Stirling! Callander, &c. *Rev. J. M. Crombie*.

IRELAND :—Dunscombe's Wood! Cork. *Mr. Carroll*.

CHANNEL ISLANDS :—Rozel Woods! Jersey. *Mr. Larchestier*.

Varies with a larger and smaller form of lirellæ, and with radiate and flexuose ones.

forma *eutypa*, Ach. pale-yellow or greyish-white, pulverulent; lirellæ crowded, flexuose, prominent, simple or branched; *epithecium* very wide, canaliculate, plane or concave, *caisia* pruinose; proper margin thick, elevated, curved and wavy, (Leight. Br. Graph. 38. Mudd 220. Schær. 91).

ENGLAND :—Ardingley! St. Leonard's Forest! Sussex! *Mr. Borrer*. New Forest! Hants. *Mr. Lyell*. Oxfordshire! *Mr. Buxton*. Berrow! Malvern Hills. *Mr. Lees*. Donnington Park! Leicestershire. *Rev. A. Bloxam*. Ingleby Park! Cleveland. *Mr. Mudd*. Stokewood, Exeter. *Mr. Parfitt*. Kelvedon, Essex. *Mr. Varcane*.

SCOTLAND :—Common in Central Counties. *Rev. J. M. Crombie*.

IRELAND :—Cultra! co. Down; Knocknagney! Belfast. *Mr. Thompson*.

CHANNEL ISLANDS :—Rozel! Jersey. *Mr. Larchestier*.

forma *spathea*, Ach. pale-yellow, fusco-nigro-limitate; lirellæ moderately long, simple, curved, numerous, scattered in all directions, approximate, sub-immersed; *epithecium* rimæform, nearly closed; proper margin thick, incurved, flexuose. (Leight. Br. Graph. 36).

ENGLAND :—St. Leonard's Forest! Sussex. *Mr. Borrer*.

SCOTLAND :—Central Counties. *Rev. J. M. Crombie*.

forma *tremulans*, Leight. pale-ashy-yellow or ashy-grey; lirellæ elongated, simple, peculiarly tremulous and wavy, prominent; *epithecium* canaliculate, pruinose; proper margin narrow, excessively flexuose and crisped. (Leight. Br. Graph. 37. Exs. 22. Mudd 219).

ENGLAND :—Sussex! *Mr. Borrer*. Gopsall Wood! Leicestershire. *Rev. A. Bloxam*. Chelmsford! Essex. *Mr. Piggot*. Kildale!



Airholme Wood! Cliffrigg! Cleveland. *Mr. Mudd.* 1 near Oswestry; Weir Coppice! near Shrewsbury, Shropshire.

IRELAND:—Killarney! *Mr. Thompson.*

WALES:—Corygedol! near Barmouth. *Rev. T. Salway.*

CHANNEL ISLANDS:—Common on all the larger Islands.

*Larbalestier.*

forma *radiata*, Leight. whitish-yellow, effuse; *lirellæ* sub-immersed, crowded, centrally radiate; *epithecium* widely canaliculate, cæsio-pruinose: proper margin stout, elevated, unequal, singularly flexuose and crisped. (Leight. Br. Graph. 35. Exs. 310. Mudd 218).

ENGLAND:—Sussex! *Mr. Borrer.* Newton Wood! Cleveland. *Mr. Mudd.* Devon. *Mr. Parfitt.* Abdon! Shropshire.

Var *pulverulenta*, Ach. whitish, effuse; *apothecia* emergent, flexuose; *epithecium* canaliculate, *dehiscent*, cæsio-pruinose; *thallodal* margin elevated, tumid.

On trees, rare.

SYN:—Ach. L. U. 266. (1810.) Syn. 82. Nyl. Scand. 252. Prodr. 149.

Exs:—Nyl. 70.

GEOG. DISTRIB:—Europe.

ENGLAND:—New Forest; Epping Forest. *Rev. J. M. Crombie.* Airholme Wood! Yorkshire. *Mr. Mudd.* Abdon! Shropshire.

SCOTLAND:—Falls of Clyde; near Stirling; Callander, &c. *Rev. J. M. Crombie.*

IRELAND:—Blarney! Cork. *Mr. Carroll.*

CHANNEL ISLANDS:—Common on all the larger islands and Jethou. *Mr. Larbalestier.*

3. *G. dendritica*, (Ach.) cream-coloured or yellowish-white, thin, tartareous, pulverulent,; *lirellæ* brownish-black, immersed, branched in a pedato-radiate manner; *perithecium* a very thin black cartilaginous entire membrane; *epithecium* broad, plane, dilated, cæsio-pruinose; proper margin very thin; *thallodal* margin prominent, rugose; spores 8, colourless, elongato-linear, apically rounded, containing 6-8 transversely oval margined cells.

On trees, rare. 1807.

forma *Smithii*, Leight. *lirellæ* ramifying at an obtuse angle, extremities acute, *thallodal* margin prominent. (Leight. Br. Graph. 43).

SYN:—*Opegrapha*, Ach. Meth. 31. (1803.) *Graphis*, Ach. Syn. 83. Nyl. Prodr. 150. *Hymenodecton*, Leight. Br. Graph. 43.

FIG:—E. Bot. 1756. Leight. Br. Graph. t. 7. f. 23.

Exs:—Rabh. 826. Arn. 334. in part.

GEOG. DISTRIB:—Germany, France, Prussia, Pyrenees, America.

BOT. PROV:—1, 2, 3...6, 7...19.. 31.

ENGLAND:—Sussex! *Mr. Borrer*. (1807.) New Forest! Hants. *Mr. Lyell*. Epping Forest. *Rev. J. M. Crombie*. near Totnes, and Coryton, S. Devon. *Dr. Holl*. Halton Wood, Exeter. *Mr. Palfitt*. Hickmore Fen Wood, Essex. *Mr. Varcane*. Ivybridge; Plymouth. *Mr. Holmes*. New Forest; Epping Forest; St. Leonard's Forest. *Rev. J. M. Crombie*.

IRELAND:—Castle Bernard Park! Bandon. *Rev. Prof. Hincks*.

WALES:—Corsygedol! near Barmouth. *Rev. T. Salwey*.

CHANNEL ISLANDS:—Jersey and Guernsey. *Mr. L. L. L. L.*

forma *acuta*, Leight. lirellæ ramifying at a very acute angle, nearly parallel, extremities simple, acuminate; thallodal margin prominent. (Leight. Br. Graph. 44. Schær. Exs 585. Larbal. 41).

ENGLAND:—St. Leonard's Forest! Sussex. *Mr. Borrer*.

IRELAND:—Castlebernard Park! Cork. *Mr. Carroll*.

WALES:—Upton! Pembrokeshire. *Rev. T. Salwey*.

CHANNEL ISLANDS:—Beaumont! and Rozel! Jersey. *Mr. L. L. L. L.*

forma *obtusa*, Leight. lirellæ ramifying at an obtuse angle in a furcate manner, extremities very obtuse, frequently furcate; thallodal margin nearly obliterated. (Leight. Br. Graph. 44).

ENGLAND:—St. Leonard's Forest! Sussex. *Mr. Borrer*. Tunbridge Wells! *Mr. Thompson*. Torquay! *Dr. Deakin*. Epping Forest. *Rev. J. M. Crombie*.

IRELAND:—Castlebernard Park! Cork. *Mr. Carroll*.

WALES:—Pembrokeshire! *Rev. T. Salwey*. Dolgelly!

4. *G. inusta*, Ach. pale-yellowish-white, thin, membranaceous, even or rugose; lirellæ black, immersed, broad, simple or branched in a sub-radiate sub-parallel manner; perithecium lateral; epithecium plane, naked or pruinose; proper margin very narrow; thallodal margin thin and membranous; spores 8, fuscous, linear or elongato-linear, apically rounded, containing 6-8 transversely oval margined cells.

On trees, frequent. 1807.

Forma *vera*, Leight. lirellæ radiate, like Chinese characters.

SYN:—Ach. Syn. 85. (1817.) *G. Smithii*, Leight. Br. Graph. 41. 42. Nyl. Prodr. 150.

FIG.—E. Bot. t. 1813. Leight. Br. Graph. t. 6. f. 22.

Exs:—Larbal. 89.

GEOG. DISTRIB:—Europe, France, Prussia, Asia, America.

BOT. PROV.—1, 2, 3. 5.. 7, 8...19.. 30, 31.

ENGLAND :—Sussex ! St. Leonard's Forest ! *Mr. Borrer.* (1807.) Malvern Hills ! *Mr. Lees.* The Lodge near Ludlow ! *Rev. T. Salwey.* Harptford Wood, Devon. *Miss Atwood.* Inworth, Essex. *Mr. Varenne.* Epping Forest. *Rev. J. M. Crombie.*

CHANNEL ISLANDS :—Guernsey ; Beaumont, St. Lawrence ! St. Peter's Valley ! Rozel Manor ! Jersey. *Mr. Larbalestier.*

forma *elongata*, Leight. lirellæ much more simple, slightly branched, linear-oblong or lanceolate, extremities acute. (Leight. Br. Graph. 42.)

ENGLAND :—Sussex ! *Mr. Borrer.* Pod's Wood ; Messing, Essex. *Mr. Varenne.*

IRELAND :—Bangor co. Down ! *Mr. Thompson.*

WALES :—Corygedol ! near Barmouth. *Rev. T. Salwey.* Glod-daeth ! Caernarvonshire.

CHANNEL ISLANDS :—St. Lawrence ! Jersey. *Mr. Larbalestier.*

forma *divaricata*, Leight. lirellæ with a simple branch at right angles. (Leight. Br. Graph. 42.)

ENGLAND :—Sussex ! *Mr. Borrer.* Gopsall ! Leicestershire. *Rev. A. Bloxam.* Oxfordshire ! *Mr. Baxter.*

IRELAND :—Duncombe's Wood ! Cork. *Mr. Carroll.*

WALES :—Dolgelley !

CHANNEL ISLANDS :—Beaumont ! Jersey. *Mr. Larbalestier.*

forma *simpliciuscula*, Leight. apothecia smaller, simple, scattered. (Leight. Br. Graph. 42. Larbal. 90.)

ENGLAND :—Sussex ! *Mr. Borrer.* Marks Hall Wood ; Pod's Wood, Messing, Essex. *Mr. Varenne.*

IRELAND :—Castlebernard Park ! Cork. *Prof. Hincks.*

CHANNEL ISLANDS :—Rozel ! Jersey. *Mr. Larbalestier.*

forma *macularis*, Leight. apothecia small, numerous, crowded, rounded or oblong. (Leight. Br. Graph. 42. Exs. 285.)

ENGLAND :—Sussex ! *Mr. Borrer.* Ragley Wood near Oxford ! *Mr. Baxter.* Llandrindod ! *Rev. T. Salwey.* Marks Hall Wood ! Essex. *Mr. Varenne.*

IRELAND :—Bangor and Cultra and Hollywood House co. Down ! *Mr. Thompson.* Castlebernard Park ! Blarney ! Cork. *Mr. Carroll.*

WALES :—Ynysfaig ! near Barmouth ; Dolgelley !

CHANNEL ISLANDS :—St. Peter's Valley ! Jersey. *Mr. Larbalestier.*

5. *G. Lyellii*, Sm. *pale-olive*, thin, *ceraceo-membraneous*, smooth ; *lirellæ* brownish black, *prominent*, sessile, oblong or linear-oblong, simple, curved ; *perithecium carbonaceous*, *entire* ; *epithecium plane*, broad, *pruinose* ; proper margin narrow, *prominent* ; *thallodal margin* elevated, *white*, *pulverulent* ; spores 8, *fuscescent*, *lineari-*

elongate, apically obtuse, containing 7-8 transversely oval margined cells.

On trees, rare. 1808.

SYN :—*Opegrapha*, Sm. E. Bot. 1876. (1808). *Graphis*, Ach. Syn. 85. Nyl. Prodr. 151. *Chiographa Lyellii*, Leight. Br. Graphid. 44.

FIG :—E. Bot. t. 1876. Leight. Br. Graph. t. 7. f. 24.

GEOG. DISTRIB :—France.

BOT. PROV :—1, 2 ..19.. 31.

ENGLAND :—New Forest ! Hampshire. *Mr. Lyell*. (1808). Harpford co. Devon ; Launceston, Cornwall ; Ringwood in New Forest. *Rev. J. M. Crombie*. near Coryton, S. Devon ; near Popes's Mill, Liskeard, Cornwall. *Dr. Holl*.

IRELAND :—Castlebernard Park ! co. Cork. *Mr. Carroll*. *Mr. Carroll* in this locality has detected several curious forms, viz : *radiata*, Carr. ! in which the lirellæ are stellately arranged, their apices more or less acute ; *fastigiata*, Carr. ! where the lirellæ are obtuse at the apices and subdendritically arranged ; *macularis*, Carr. ! in which the lirellæ are smaller, round or oblong, confluent into obtusely crenate groups.

CHANNEL ISLANDS :—Rozel, Jersey. *Mr. Larbalestier*.

### B. Spores murali-divided.

6. *G. Ruiziana*, (Fée.) greyish-cream-coloured, thin, membranaceous, smooth, nigro-limitate ; lirellæ excessively prominent and sessile, large, linear-oblong, obtuse at the extremities, straight or wavy, simple, occasionally tripartite ; epithecium rimæform, more or less expanded ; perithecium thick, carbonaceous, entire ; proper margin tumid and connivent ; spores 8, colourless, oblong or elliptical, murali-locular, large.

On holly, rare. 1857.

SYN :—Fée Essai p. 27. (1824.) Nyl. N. Gran. 73. *Opegrapha anomala*, Leight. Ann. and Mag. Nat. Hist. 1857.

FIG :—Ann. and Mag. Nat. Hist. t. 8. f. 1.—6.

GEOG. DISTRIB :—N. Granada, Europe.

BOT. PROV :—19.

IRELAND :—Glengariffe ! co. Kerry. *Mr. Piggot*. (1857.) Castlemartyr Deer park ! Glenbower, Killeagh. *Mr. Carroll*. Killarney. *Messrs. Piggot & Carroll*.

7. *G. sophistica*, Nyl. pale-whitish-yellow or cream colour, thin, membranaceous, continuous, smooth or slightly uneven ; lirellæ black, emergent, slender, contracted here and there, simple or branched, wavy and scattered, extremities acuminate ; perithecium lateral ; epithecium rimæform, naked ; proper margin thin, ele-

vated, wavy and crisped; *thallodal margin membrana-ceous*; spores 8, colourless, oblong or ellipsoid, murali-multilocular.

On trees, frequent.

SYN:—Nyl. N. Gran. 74. (1864.) *Gr. scripta*, Leight. Br. Graph. p. 27. and *Gr. pulverulenta*, Leight. Br. Graph. p. 31.

FIG:—Leight. Br. Graph. t. 6. 17.

EXS:—Lindig 71.

GEOG. DISTRIB:—France, N. Granada, N. Zealand.

BOT. PROV:—2, 3...5. .7, 8...11...13, 14, 15.. 19...33.

The following forms are noticeable.

forma *diffusa*, Leight. lirellæ rather long, simple or with a single branch, variously curved and wavy, lying in all directions. (Leight. Br. Graph. p. 27. Bohl. 28.)

ENGLAND:—Sussex! *Mr. Borrer*. Stoke Wood, Exeter. *Mr. Parfitt*.

IRELAND:—Cultra! co. Down; Colin Glen! Belfast. *Mr. Thompson*.

forma *flexuosa*, Leight. lirellæ elongated, simple or branched, flexuose. (Leight. Br. Graph. p. 28. Exs. 18. Hoffm. En. t. 3. f. 26.)

ENGLAND:—Sussex! *Mr. Borrer*. New Forest! Hants. *Mr. Lyell*. Oswestry! Shropshire. *Rev. T. Salwey*. Gopsal! Leicestershire. *Rev. A. Bloxam*.

SCOTLAND:—Loch Tay Woods! *Dr. Greville*.

WALES:—Gloddaeth! near Conway.

forma *radiata*, Leight. lirellæ dendritically radiate. (Leight. Br. Graph. p. 29. Mudd 215.)

ENGLAND:—Sussex! *Mr. Borrer*.

SCOTLAND:—Rammerscales! Dumfriesshire. *Mr. Thompson*.

IRELAND:—Cultra! co. Down. *Mr. Thompson*.

forma *divaricata*, Leight. lirellæ divaricately branched. (Leight. Br. Graph. p. 29. Exs. 19. Mudd 216. Hoffm. En. t. 3. f. 2. a.)

ENGLAND:—Sussex! *Mr. Borrer*. Berwick-on-Tweed! *Dr. Johnston*. Twycross! Leicestershire. *Rev. A. Bloxam*.

SCOTLAND:—Rae Hill Woods! *Dr. Greville*.

IRELAND:—Bangor! co. Down. *Mr. Thompson*. Castlebernard Park! Bandon. *Rev. Prof. Hincks*.

WALES:—Gloddaeth! near Conway.

Var. *pulverulenta*, (Sm.) pale-dull-ashy-yellow or cream colour, *thin or tartareous and pulverulent*, continuous, rugulose; *lirellæ sub-sessile, broadish, extremities cuspidate*; perithecium lateral; *epithecium broadly canaliculate*



*pruinose*; proper margin thick, elevated, uniform; *thalloidal margin elevated, tumid*; spores 8, colourless, oblong or ellipsoid, murali-multi-locular.

SYN:—Sm. E. Bot. 1754. (1807.) Leight. Br. Graph. p. 31.

FIG:—E. Bot. 1754. Leight. Br. Graph. t. 6. f. 18.

EXS:—Leight. 20.

GEOG. DISTRIB:—Europe.

BOT. PROV:—2, 3...5...7...8.. 19...30, 31.

ENGLAND:—Sussex! *Mr. Borrer*. Hartshill Wood! near Atherstone! Gopsall Wood! Donnington Park! Leicestershire. *Rev. A. Bloxam*. near the Berrow, S. end of Malvern Hills! *Mr. Lees*. New Forest! Hants. *Mr. Lyell*. Haldon, Exeter. *Mr. Parfitt*. Kelvedon; Braxted; Messing, Essex. *Mr. Varenne*.

IRELAND:—Montalto! Cultra! Bangor! co. Down. *Mr. Thompson*. Blarney! co. Cork. *Mr. Carroll*.

WALES:—Barmouth! *Rev. T. Salwey*. Gloddaeth! near Conway.

CHANNEL ISLANDS:—St. Peter's Valley! Jersey. *Mr. Larbalestier*.

#### IV. OPEGRAPHA, *Ach. Nyl.*

Thallus very thin or scarcely any. Apothecia (lirellæ) black, superficial, lineari-lanceolate or sub-rotundate or linear, elongate or flexuose or ramoso-divided, with a proper margin; perithecium entire; epithecium plane or rimiformi-angustate; spores 8, colourless or fuscicent, linear-oblong, sub-clavato-fusiform, fusiform or acicular, 1-multi-septate.

##### \* Spores 1-septate.

1. *O. lentiginosa*, Lyell MS. cream-coloured, thin, tartareous, smooth, nigro-fusco-limitate; *lirellæ excessively prominent and sessile, very minute, punctiform, oblong or linear, straight, simple*; perithecium entire; epithecium rimiform; proper margin tumid and incurved; spores 8, fuscicent, irregularly obovate, 1-septate, constricted.

On beech and holly and oak, rare.

SYN:—Leight. Br. Graph. 26. (1854.) Nyl. Prod. 158.

FIG:—Leight. Br. Graph. t. 6. f. 16.

GEOG. DISTRIB:—France, Normandy.

BOT. PROV:—1, 2...19.

ENGLAND:—New Forest! Hants. *Mr. Lyell in herb. Borrer*. St. Leonard's Forest! Sussex. *Mr. Borrer*. near Lyndhurst, New Forest. *Rev. J. M. Crombie*. Tilgate Forest, Sussex. *Mr. Larbalestier*. Ivybridge. *Mr. Holmes*.

IRELAND:—Curraghmore. *Adm. Jones*. Old Deer Park, Castle-martyr, Cork; Glenbower, Killeagh. *Mr. Carroll*.

2. *O. lentiginosula*, Nyl. *thallus evanescent, lirellæ excessively prominent and sessile, very minute, ellipsoid, straight, simple, rarely divided; perithecium colourless or deficient at the base; epithecium rimiform; proper margin tumid and incurved; spores 8, fuscous, obovate, 1-septate, constricted, larger than in lentiginosa; paraphyses indistinct.*

On pines in sub-alpine regions, rare. 1864.

SYN:—Nyl. in Flora 1865. p. 355.

GEOG. DISTRIB:—Europe.

BOT. PROV:—15.

SCOTLAND:—Glenfalloch! Mr. Carroll. 1864.

3. *O. diplasiospora*, Nyl. *albido-glaucous, thin, smooth, membranaceous, effuse; lirellæ oblong or lanceolato-oblong, small, innato-erumpent, black; epithecium expanded, plane; proper margin thin, elevated, inflexed; perithecium nigro-fuscous, entire at the base; paraphyses none; spores 8, fusco-nigrescent, obovate, 1-septate, constricted, double the size of those of O. lentiginosa.*

On holly in mountain ranges, rare. 1867.

SYN:—Nyl. N. Granada ed. 1. 62. (1863,) ed. 2. 92.

FIG:—Nyl. N. Gran. ed. 1. t. 2. f. 41.

EXS:—Lindig 2787. & 846.

GEOG. DISTRIB:—N. Granada, Europe.

BOT. PROV:—19.

IRELAND:—Turk Mountain!; Cromaglow, Killarney. Mr. Carroll. (1867).

### \*\* Spores 3-septate.

4. *O. herpetica*, Ach. *dusky-olive, thin, sub-tartareous, more or less cracked or slightly rugged, fusco-limitate, (K reddish); lirellæ small, innate, round, oval, oblong or linear-oblong, obtuse, simple and divided, straight or curved; disk rimiform, expanded in age; proper margin thick, rounded and inflexed; spores 8, colourless, fusiform, 3-septate.*

On trees, frequent.

*forma vera*, Leight. *thallus tuberculate, pulverulent; lirellæ imbedded, small, simple, naked.*

SYN:—Leight. Br. Graph. 19. (1854.) Ach. Syn. 72. Nyl. Scand. 255.

FIG:—E. Bot. 1789. Leight. Br. Graph. t. 5. f. 12.

EXS:—Nyl. 81. Mudd 213. Hepp 555.

GEOG. DISTRIB.:—Europe, France, Switzerland, Sweden, N. America.

BOT. PROV.:—1...3, 4, 5.. 8...11.. 15.. 19...28...31.

ENGLAND:—Bradwell! Suffolk. *Mr. Borrer*. Twycross! Charnwood Forest! Leicestershire. *Rev. A. Bloxam*. Epping Forest and Exeter. *Rev. J. M. Crombie*. Oxfordshire! *Mr. Baxter*. Chelmsford! Essex. *Mr. Pigott*. near Newcastle, Northumberland. *Mr. Winch*. Haldon Wood, Exeter. *Mr. Porritt*. Ivybridge. *Mr. Davies*. Haughmond Hill! Weir Coppice near Shrewsbury!

SCOTLAND:—Lasswade! and near Dundee! *Dr. Greville*. near Stirling. *Rev. J. M. Crombie*.

IRELAND:—Armagh. *Adm. Jones*. Turk Mountain and McCarthy's Island, Killarney. *Mr. Carroll*.

CHANNEL ISLANDS:—St. Peter's Valley! Jersey. *Mr. Larbalestier*.

forma *sub-ocellata*, Ach. thallus tuberculate, pulverulent (K reddish); *lirellæ* imbedded, small, simple or sub-stellate, *albo-ocellate*.

On trees, frequent.

SYN:—Leight. Br. Graph. 21.

FIG:—Chevall. Hist. Graph. t. 19. f. 4. & f. 3.

EXS:—Hepp 556. Leight. 222. M. & N. 555. Schaer. 281. Nyl. 82. Anzi 338. Zw. 355.

GEOG. DISTRIB.:—Switzerland, Italy, Germany, France, Sweden.

BOT. PROV.:—2, 3...10 ..31.

ENGLAND:—Hurst! Cuckfield! and Ardingley! Sussex. *Mr. Borrer*. Bovingar! Essex. *Mr. Lyell*. near Thirsk! Yorkshire. *Mr. Baker*. Cliffrigg! Airyholme Wood! Kildale! Easby Wood! Yorkshire. *Mr. Mudd*.

CHANNEL ISLANDS:—Jersey. *Mr. Larbalestier*.

forma *elegans*, Borr. thallus pulverulent, (K reddish); *lirellæ* larger, simple and divided, prominent, wavy.

On trees, rare.

SYN:—Leight. Br. Graph. 21. (1854).

EXS:—Leight. 286.

GEOG. DISTRIB.:—Europe.

BOT. PROV.:—2, 3.. 10...15.

ENGLAND:—Ardingley! Sussex. *Mr. Borrer*. Easby Wood! Ingleby! Yorkshire. *Mr. Mudd*. Epping Forest and Exeter. *Rev. J. M. Crombie*.

SCOTLAND:—near Stirling. *Rev. J. M. Crombie*.

forma *rubella*, Pers. thallus smooth, (K reddish); *lirellæ* prominent, simple, immersed only at the base.

On trees, common.

SYN:—Pers. Ust. Ann. Bot. st. 7. t. 1. f. 2. A. a. (1794.) Leight. Br. Graph. p. 22. *Opeg. herpetica* var. *disparata*, Ach. Syn. 73. Nyl. Scand. 255.

FIG :—Cheval. Hist. Graphid. t. 17. f. 1. a. f. 2.

EXS :—Scharf. 95. Leight. 221. Anzi 339. Bohl. 74. Hej. 557.

GEOG. DISTRIB :—Switzerland, Italy, Pyrenees, France, Germany, Sweden.

BOT. PROV :—2, 3...5...10...31.

ENGLAND :—St. Leonard's Forest ! and Charlton Forest ! Sussex. *Mr. Borrer*. Berrow, S. end of Malvern Hills ! Worcestershire. *Mr. Lucas* Yorkshire. *Mr. Dixon*. Airyholme Wood ! Cliffrigg ! Cleveland. *Mr. Mudd*. Stoke Wood, Exeter. *Mr. Parfitt*.

CHANNEL ISLANDS :—Grouville, Jersey. *Mr. Larchabster*

forma *rufescens*, Pers. dark-dingy-olive, (K reddish) *livelle* prominent, immersed only at the base, *flexuose*, *sub-stellato-ramose* ; epithecium plane, more or less canalliculate.

On ash and birch trees, not common.

SYN :—*O. rufescens*, Pers. Ust. Ann. Bot. st. 7. p. 29. t. 2. f. 3. A. a. (1794.) Nyl. Scand. 256. *O. siderella*, Ach. Syn. 79. *O. herpetica* var. *rubella* f. *divisa*, Leight. Br. Graph. 22.

FIG :—Cheval. Hist. Graph. t. 18. f. 1. a. f. 26. f. 3. c.

EXS :—Mudd 214.

GEOG. DISTRIB :—Normandy, Italy, Sweden, Belgium

BOT. PROV :—2, 3...5...8...10.

ENGLAND :—Sussex ! *Mr. Borrer*. Gopsall Wood ! Leicestershire. *Rev. A. Blom*. near Ayton ! Cleveland. *Mr. Mudd*. Stoke W. Exeter. *Mr. Parfitt*. Weir Coppice ! near Shrewsbury.

5. *O. atra*, Pers. thallus very thin, forming pale-yellow or whitish ocellate patches ; *livelle* crowded towards the centre of the thallodal space, depressed, lying in all directions or sub-parrallal, generally simple or confluent, flexuose ; epithecium narrow, uniform, rimiform, more or less open and canalliculate ; proper margin thick, elevated, wavy, colourless, obovato-fusiform, somewhat pointed at the extremities, 3-septate, very minute.

On trees, common.

SYN :—Pers. in Ust. Ann. Bot. st. 7. p. 30. (1794.) Nyl. Scand. 254. Leight. Br. Graph. p. 18.

FIG :—Hoffm. En. t. 3. f. 2. c. Leight. Br. Graph. t. 5. f. 11.

EXS :—Anzi It. S. 335.

GEOG. DISTRIB :—France, Switzerland, Germany, Hungary, Italy, Asia, Africa, America.

BOT. PROV :—1, 2, 3...5...7, 8...14, 15...19...30, 31.

ENGLAND :—Sussex ! *Mr. Borrer*. Gopsall ! Leicestershire. *Rev. A. Blom*. Budleigh Salterton. *Dr. Dickie*. Fordham, Essex. *Mr. Farman*. Plymouth. *Mr. Holmes*. St. Leonard's Forest ; New

Forest ; Epping Forest. *Rev. J. M. Crombie*. Weir Coppice ! near Shrewsbury, Shropshire.

SCOTLAND :—Near Edinburgh ! *Dr. Greville*. near Stirling ; Callander ; Blair Athole ; Lochaber. *Rev. J. M. Crombie*.

IRELAND :—Dunkettle ! Cork. *Mr. Carroll*. Knocknagoney ! Colin Glen ! Belfast ; Massareene Park ! co. Antrim. *Mr. Thompson*.

WALES :—Craig Breidden ! Montgomeryshire.

CHANNEL ISLANDS :—Jersey and Guernsey. *Mr. Lorbalestier*.

forma *denigrata*, (Ach.) *lirellæ* more or less crowded and numerous, *irregularly scattered*, simple or branched.

On ash trees, common.

SYN :—Ach. Meth. 27. (1803.) Syn. 75. Mudd Man. 232.

FIG :—E. Bot. 1753. in part.

EXS :—Nyl. 143. Schaer. 461. Mudd 208. M. & N. 469.

GEOG. DISTRIB :—France, Switzerland, Sweden, Hungary.

BOT. PROV :—1, 2, 3 ..7...10...15...(19—30)...31.

ENGLAND :—Near Ayton ! Cleveland. *Mr. Mudd*. Exeter. *Mr. Parfitt*. Marks Hall, Essex. *Mr. Varenne*. New Forest. *Rev. J. M. Crombie*. Nesselcliffe Hill ! Shropshire.

SCOTLAND :—Near Stirling. *Rev. J. M. Crombie*.

IRELAND :—Frequent. *Mr. Carroll*.

WALES :—Craig Breidden ! Montgomeryshire.

CHANNEL ISLANDS :—Jersey and Guernsey. *Mr. Lorbalestier*.

forma *nigrita*, Leight. *lirellæ* densely crowded and confluent into *irregular black central masses*.

On ivy &c., frequent.

SYN :—Leight. Br. Graph. 18. in part. (1853).

FIG :—Chev. Hist. Graph. t. 3. f. 6. d.

EXS :—Leight. 193. Mudd 210.

GEOG. DISTRIB :—Belgium.

BOT. PROV :—1, 2, 3...5... 7 ..10...15, 16.

ENGLAND :—Netley Abbey ! Hants. *Mr. Lyell*. Sussex ! *Mr. Borrer*. Shropshire ! *Rev. T. Salwey*. Essex ! *Mr. Piggott*. Yorkshire ! *Mr. Dixon*. Airyholme Wood ! near Ayton ! Cleveland. *Mr. Mudd*. Devon. *Mr. Parfitt*. Kelvedon, Essex. *Mr. Varenne*. Tong Priory ! Shelton ! near Shrewsbury, Shropshire.

SCOTLAND :—Callander ; Appin. *Rev. J. M. Crombie*.

WALES :—Conway ! Bettws-y-Coed !

forma *parallela*, Leight. *lirellæ* lineari-elongate, *horizontally parallel*.

On cherry, hazel, &c. not unfrequent.

SYN :—*Opegrapha Cerasi & Coryli*, Chev. Fl. Par. 1. 521. (1836).

FIG :—Chev. Hist. Graph. t. 1. f. 3. & 4. t. 2. f. 1. & 2.

EXS :—Mudd 209. Leight. 245.

GEOG. DISTRIB :—France, Belgium, Normandy.

BOT. PROV :—1, 2, 3...5...10 ..19.. 31.



ENGLAND :—Sussex! *Mr. Borrer*. Yorkshire! *Mr. Dixon*. Cockshaw Bank! Cleveland. *Mr. Mudd*. Torquay! Devon. *Dr. Deakin*. New Forest. *Rev. J. M. Crombie*. Woodham Walter, Essex. *Mr. Varenne*. Abdon! Loppington! Shropshire.

SCOTLAND :—Near Stirling. *Rev. J. M. Crombie*.

IRELAND :—Castlebernard; *Prof. Hineks*. Fermoy! *Mr. Carroll*.

CHANNEL ISLANDS :—Jersey and Guernsey. *Mr. Larbalestier*.

forma *herbarum*, Mont. yellowish or whitish; *lirellæ* erumpenti-innate, flexuose, simple, *linear-elongate*, *longitudinally sub-parallel*; *epithecium rimiform*.

On stems of various flowering plants and ferns, rare

SYN :—Mont. Arch. de Bot. 1833. p. 302. Syllog. 350. Schær. En. 153.

FIG :—Arch. Bot. t. 15. f. 1.

GEOG. DISTRIB :—France.

BOT. PROV :—19.

IRELAND :—Muckruss, Killarney. *Mr. Carroll*.

forma *hapalea*, Ach. *lirellæ* confluent, *epithecium deplanate*.

On various trees, not frequent.

SYN :—Ach. Syn. 79. (1817.) Nyl. Prodr. 158.

FIG :—Chev. Hist. Graph. t. 6, fig 1. a.

Exs :—M. & N. 649. Schær. 586, Anzi It. S. 337. 336.

GEOG. DISTRIB :—Switzerland, Italy, Pyrenees, Hungary.

BOT. PROV :—2...5...19.

ENGLAND :—Sussex! *Mr. Borrer*. Holly Bush Hill! Malvern range. *Mr. Lees*. Epping Forest. *Rev. J. M. Crombie*.

IRELAND :—Carrigaloe, Cork. *Mr. Carroll*.

forma *arthonoidea*, Leight. *lirellæ* difformed, confluent in irregular sub-stellate scattered deplanate spots.

On various trees, not common.

SYN :—Mudd Man. 232. (1861).

Exs :—Leight. 338. Schær. 463. 634.

GEOG. DISTRIB :—Switzerland, Italy, Hungary, Pyrenees.

BOT. PROV :—1, 2, 3...7.

ENGLAND :—Devon. *Dr. Dickie*. Marks Hall, Essex. *Mr. Varenne*. Epping Forest. *Rev. J. M. Crombie*.

WALES :—Conway!

forma *ochrocheila*, Nyl margins of *lirellæ* ochraceous; *epithecium* expanded, plane.

On ivy, elm and grass, rare.

SYN :—Nyl. in Flora 1865. p. 212.

GEOG. DISTRIB :—France.

BOT. PROV :—19...31.

IRELAND :—(Saxicole.) Dinish! Killarney. *Mr. Hardy*.

CHANNEL ISLANDS :—L'Ancrese. Common. Guernsey!; St

Peter's Valley ; Meadow Bank, Jersey ! *Mr. Larbalestier*.

6. *O. Turneri*, Leight. pale-dirty-yellow, fusco-liminate ; *lirellae* very prominent, sessile, mostly simple, slender and linear ; *epithecium* very narrow, uniform ; proper margin plump, rounded and incurved ; spores colourless, *linear-obovate*, 3-septate.

On trees, frequent.

Quite distinct from *O. varia f. rimalis*.

SYN :—Leight. Br. Graph. 17. (1853.) *O. atrorimalis*, Nyl. in Flora 1864. p. 488.

FIG :—E. Bot. 2281. Leight. Br. Graph. t. 5. f. 10.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2, 3, 4, 5...7...10.. 15...19.. 29, 30.

ENGLAND :—Hurstpierpoint ! Sussex ; Bradwell ! Burgh ! Suffolk ! *Mr. Borrer*. New Forest ! Hants. *Mr. Lyell*. near Worcester ! *Mr. Lees*. Cliffrigg ! Ingleby Park, Cleveland. *Mr. Mudl*. Essex ! *Mr. Pigott*. Highbeech, Epping Forest ! *Rev. J. M. Crombie*. Colne, Essex. *Mr. Varenne*. Loppington ! Haugemond Hill ! Dorrington ! Shropshire.

SCOTLAND :—Blair Athole ! *Rev. J. M. Crombie*.

IRELAND :—North of Ireland ! *Miss Hutchins*. Colin Glen ! : Brett's Glen ! Belfast. *Mr. Thompson*. Brown's demesne, Rivers-town near Cork ! *Mr. Carroll*.

WALES :—Capel Curig !

7. *O. confluens*, (Ach.) *greyish-green*, effuse, very thin, often obsolete ; *lirellae* sessile, simple, black, opaque, thick, cylindrical, straight or oftener curvate and contorted, very rarely solitary, scattered, *generally crowded or conglobate* ; *epithecium* narrow, rimiform, sub-dilatate in age ; margin at first rotundate, inflexed, presently acute ; paraphyses septate, branched ; spores 8, colourless, elongato-oval or soleæform, 3-septate.

On sub-alpine rocks, rare.

SYN :—*O. lithyrga var. confluens*, Ach. L. U. p. 247 (1810.) Stizb. Stein. Opeg. 22.

FIG :—Stizb. Stein. Opeg. t. 2. f. 1. a—m.

Exs :—Nyl. 144. Anzi Etr. 36. Rabh. 339.

GEOG. DISTRIB :—Switzerland.

BOT. PROV :—19.

IRELAND :—Southern Counties. *Mr. Carroll*.

8. *O. saxicola*, Ach. dirty-white or rusty-brown ; *lirellae* oblong or ovate, deformed, short, obtuse, variously branched, rounded or triquetrous, wider at one extremity ; *epithecium* rimiform, more or less expanded ; proper

margin tumid, round and incurved. spores 8, colourless, linear-oblong or linear-clavate, rounded at each extremity, 3-septate.

On rocks, frequent.

SYN.—Ach. Syn. 71. (1817.) Nyl. Scand. 254. Stizb. Stein. Opeg. 23. *O. rupestris*, Pers. Ust. Ann. xi. 20. Leight. Br. Graph. 11.

FIG :—E. Bot. 2345. Leight. Br. Graph. t. 5. f. 5

EXS :—Schær. 94. Leight. 343. Zw. 145. A. Arn. 104.

GEOG. DISTRIB :—Normandy, Italy, Germany, Pyrenees, Madeira.

BOT. PROV :—1, 2...5...7...10...19...29, 30, 31.

ENGLAND :—Netley Abbey! *Mr. Lyell*. Newton Wood! Yorkshire. *Mr. Baker*. Nent Force! Cumberland. *Mr. Roberts*. Plymouth. *Mr. Holmes*. Nesselcliff Hill! Shropshire.

IRELAND :—North of Ireland! *Miss Hutchins*. Larnacoe! Artrim. *Mr. Thompson*. Muckruss! Rostellan! Cork Harbour. *Mr. Carroll*.

WALES :—Barmouth! *Rev. T. Salway*. Great Orme's Head!

CHANNEL ISLANDS :—Near Ann Port; Boulay Bay; Rozel Meadow; Noirmont, Jersey. *Mr. Larbalestier*.

Var. *DeCandollei*, Stizb. whitish or dirty-rusty-brown, lirellæ linear, linear-oblong, oblong or ovate, expanded, obtuse at the extremities, chiefly simple and straight, dark-brown; spores 8, colourless, narrow, linear-oblong, round at each extremity, 3-septate.

On rocks, rare.

SYN :—Stizb. Stein. Opeg. 29. (1865.) *Op. sarigona*, Tayl. Fl. Hib. 2. 259. Leight. Br. Graph. 13. *O. saxatilis*, DC. Fl. Fr. 2. 312. *Verrucaria umbrosa*, Tayl.

FIG :—Leight. Br. Graph. t. 5. f. 7.

EXS :—Leight. 311. Anzi Langob. 406. Anzi Venet. 104.

GEOG. DISTRIB :—France, Italy, Hungary.

BOT. PROV :—1...19...24...31.

ENGLAND :—Torquay. *Mr. Paxfitt*.

IRELAND :—Dunkerron! *Dr. Taylor*. Kerry. *Dr. Moore*. Crog-hain! Killarney; Kilkee, co. Clare. *Mr. Carroll*.

CHANNEL ISLANDS :—Boulay Bay, Jersey! *Mr. Larbalestier*.

Var. *Chevallieri*, Leight. white or pale-yellow; lirellæ simple, linear, elongated, curved or bent back, flexuose and wavy, black, crowded or conglomerate, shining; spores 8, colourless, broadly clavate, rounded at each extremity, 3-septate.

On rocks, frequent. 1807.

SYN :—Leight. Br. Graph. 10. (1853.) *Opeg. calcarea*, Turn. in E. Bot. 1790. (1807).

FIG :—Leight. Br. Graph. t. 5. f. 4. E. Bot. t. 1790.

EXS :—Leight. 67, Larbal. 44, Anzi Etr. 37, Mudd 203.

GEOG. DISTRIB :—Belgium, Italy, Normandy.

BOT. PROV :—1, 2, 3, 4, 5, 6, 7...10...14...12...23, 24...30, 31.

ENGLAND :—Netley Abbey! *Mr. Lyell*. North of England! *Rev. J. Harriman*. Craigforda! near Oswestry, Shropshire. *Rev. T. Salway*. Tantallon Castle! *Dr. Lindsay*. Roseberry! Cleveland. *Mr. Mudd*. Suffolk! *Sir Thos. Gage*. Budleigh Salterton, Devon. *Mr. Parfitt*. Kelvedon, Essex. *Mr. Farman*. Kingsbridge! S. Devon. *Dr. Holl*.

SCOTLAND :—Caroline Park, Edinburgh. *Dr. Burchell*.

IRELAND :—Killarney! *Miss Hatchins*, near Dublin! Derriquin! co. Kerry. *Dr. Taylor*. Colm Glen, Belfast! *Mr. Thompson*. Ross! co. Clare; near Lighthouse, Cork Harbour! *Mr. Carroll*.

WALLS :—North Wales! *Rev. Hugh Davies*. Llanaber! Barmouth! Pembrokeshire! *Rev. T. Salway*. Cape St. Vincent Rock, between Alerdovey and Towyn! *Rev. A. Blouin*. Great Orme's Head! South Stacks! Holyhead! Aber!

CHANNEL ISLANDS :—Guernsey; Noirmont Warren; St. Ouen's and St. Saviour's, Jersey! *Mr. Larbalestier*.

*forma gyrocarpa*, (Zw.) greyish; apothecia sessile, rotundato-deformed; *epithecium gyroso-plicate*.

SYN :—Flotow in Flora 1825. p. 345. Körb. Syst. 280.

FIG :—Stizb. Stein. Opeg. t. 2. f. 2. κ. λ. μ—o.

GEOG. DISTRIB :—Hungary, Germany.

BOT. PROV :—2...15...19...31.

ENGLAND :—Shanklin, Isle of Wight. *Dr. Holl*.

SCOTLAND :—Craig Guie, Grampians. *Rev. J. M. Crombie*.

IRELAND :—Mangerton, Killarney. *Mr. Carroll*.

CHANNEL ISLANDS :—Boulay Bay! Jersey. *Mr. Larbalestier*.

Var. *Persoonii*, Ach. white or albicant, thin, opaque, sub-leprose, unequal; lirellæ oblong, small; epithecium pliciform or at length subdehiscent, often rugose and deformed; spores 8, colourless, fusiform, 3-septate.

On calcareous rocks, rare.

SYN :—Ach. Meth. 17. *Lichen Persoonii*, Ach. Prodr. 19. Nyl. Scand. 254. (excl. syn. Leight. Br. Graph.)

GEOG. DISTRIB :—Sweden.

BOT. PROV :—24.

IRELAND :—Kilkee, co. Clare. *Mr. Carroll*.

9. *O. grumulosa*, Duf. white, farinaceous, thick; apothecia caesio-pruinose, lanceolate or deformed, normally marginate, internally black; spores 8, colourless, oblongo-fusiform, 3-septate.

On rocks, rare.

SYN :—Duf. Journ. Phys. 1848. vol. 87. p. 214. Nyl. Prodr. 152.

EXS :—Zw. 144. Anzi Langob. 404.

GEOG. DISTRIB :—France, Germany, Italy, Algeria.

BOT. PROV :—31.

CHANNEL ISLANDS :—La Coupe ; Rozel, Jersey. *Mr. Larbalestier*.

\*\*\* *Spores 5-septate.*

10. *O. varia*, Pers. *thallus white, pulverulent ; lirella prominent, sessile, round, oblong, elliptical, elongate, attenuated at each end ; epithecium canaliculate or dilated in the middle or plane and convex ; proper margin prominent, inflexed, sometimes subevanescent ; spores 8, colourless, irregularly obovate or obovato-fusiform, 5-septate.*

The following are the principal states of this very variable species.

forma *pulicaris*, Lightf. *lirellæ oval, oblong or elliptical, minute, simple ; epithecium concave, dilated in the middle ; proper margin persistent, inflexed.*

On various trees, common.

SYN :—Lightf. Fl. Scot. 2. 801. (1777.) Nyl. Scand. 253. Leight. Br. Graph. 14.

FIG :—Ach. Meth. t. 1. f. 9. Chev. Graph. t. 14. f. 3. & 4. Leight. Br. Graph. t. 5. f. 9.

EXS :—Schar. 97. 518. 520. Zw. 5. A. C. Nyl. 73. 74. Anzi It. S. 329. 330. 331. Hepp 892. 166. Arn. 318. M. & N. 954.

GEOG. DISTRIB :—Sweden, Switzerland, France, Italy, Hungary, Normandy, Germany, Belgium, Pyrenees, Algeria.

BOT. PROV :—1, 2, 3...15...19...24...31

ENGLAND :—Sussex! *Mr. Borrer*. New Forest! Hants. *Mr. Lyell*. Kelvedon. Essex. *Mr. Vercenne*. Stoke Wood, Devon. *Mr. Parfitt*. Plymouth. *Mr. Holmes*. Epping Forest ; near Exeter. *Rev. J. M. Crombie*. Abdon! Bickley Coppice! near Shrewsbury, Shropshire.

SCOTLAND :—Near Stirling ; Killin ; Banchory in Aberdeen. *Rev. J. M. Crombie*.

IRELAND :—Castleconnel near Limerick! co. Clare ; Rostellan, Cork. *Mr. Carroll*.

CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier*.

forma *notha*. Ach. *lirellæ round or oblong, deformed, large ; epithecium plane or convex, obliterating the proper margin.*

On oak, common.

SYN :—Ach. Prodr. 19. (1798.) Syn. 76. Nyl. Scand. 253. Leight. Br. Graph. 15.

FIG :—E. Bot. 1890. Leight. Br. Graph. t. 5. f. 9.

EXS :—M. & N. 857. Schar. 282. Leight. 66. Hepp 165. Nyl. 75. Anzi It. S. 327. Larbal. 91.



GEOG. DISTRIB :—France, Switzerland, Belgium, Italy, Normandy, Austria, Germany.

BOT. PROV :—2, 3, 4, 5...10, 11...15...31.

ENGLAND :—Yarmouth. *Mr. Turner*. (1808.) Epping Forest. *Rev. J. M. Crombie*. Sussex! *Mr. Borrer*. High Vawr lane, Oswestry, Shropshire. *Rev. T. Salwey*. Ingleby! Cleveland. *Mr. Mudd*. Teesdale; Cawsey Wood, Durham; Hexham and Corbridge, Northumberland. *Mr. Winch*. Berwick. *Dr. G. Johnston*. Red Hills, Exeter. *Mr. Parfitt*. The Bartons, Ledbury! (*saxicole*) *Dr. Holl*. Montford Bridge! near Shrewsbury; Haughmond Hill! base of Caer Caradoc! Heywood Forest near Ludlow! Shropshire.

SCOTLAND :—Near Stirling. *Rev. J. M. Crombie*.

CHANNEL ISLANDS :—(*saxicole*) La Coupe, Jersey! *Mr. Lurbalestier*.

forma *diaphora*, Ach. *lirellae elongate, attenuate at both extremities*; *epithecium plane*; proper margin persistent, flexuose.

On oak, frequent.

SYN :—Ach. Prodr. 20. (1798.) Syn. 77. Nyl. Scand 253. Leight. Br. Graph. 15.

FIG .—Leight. Br. Graph. t. 5. f. 9.

EXS :—Schar. 98. 519. M. & N. 468. 556. Leight. 220. Anzi It. S. 328. 332. Zw. 4. Mudd 206. Nyl. 76. 77.

GEOG. DISTRIB :—Switzerland, Germany, Italy, Hungary, Belgium, Pyrenees, France, Sweden.

BOT. PROV :—1, 2, 3...10, 11...15.. (19—30). 31.

ENGLAND :—Sussex! *Mr. Lorrer*. Kildale! Easby Wood! Airyholme Wood! Cleveland. *Mr. Mudd*. Mill Hill, Middlesex; Lyndhurst; New Forest; Epping Forest. *Rev. J. M. Crombie*. Wear dale; Teesdale; Ravensworth and Caswey Woods, Durham. *Mr. Winch*. Whitstone Hill, Exeter. *Mr. Parfitt*. Kelvedon, Essex. *Mr. Varcane*.

SCOTLAND :—Near Stirling; Killin. *Rev. J. M. Crombie*.

IRELAND :—Frequent. *Mr. Carroll*.

CHANNEL ISLANDS :—Jersey and Guernsey. *Mr. Lurbalestier*.

forma *tigrina*, Ach. *lirellae linear-oblong, obtuse at the extremities*; *epithecium canaliculate*, nearly uniform; proper margin persistent, rounded and inflexed.

On various trees, not unfrequent.

SYN :—Ach. L. U. 262. (1810.) Leight. Br. Graph. 16.

FIG :—E. Bot. 2280. Leight. Br. Graph. t. 5. f. 9.

EXS :—Bohl. 52. Leight. 287. Mudd. 205.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2, 3, 4, 5...10.. 31.

ENGLAND :—New Forest! Hants. *Mr. Lyell*. Hurstpierpoint, Sussex!; Haddisco, Norfolk!; Coulsdon, Surrey! *Mr. Borrer*. Kildale! Yorkshire. *Mr. Mudd*. Kelvedon, Essex. *Mr. Varcane*. Nesseliff! Haughmond Hill! Shropshire.

CHANNEL ISLANDS :—Jersey and Guernsey. *Mr. Larchabastier*.

forma *tridens*, Ach. *lirellæ elongate, stellate*; epithecium *canaliculate*; proper margin persistent, rounded and inflexed.

On various trees, rare.

SYN :—Ach. L. U. 263. (1810.) Syn. 79. Leight. Br. Graph. 16.

FIG :—Leight. Br. Graph. t. 5. f. 9.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2, 3...31.

ENGLAND :—New Forest! Hants. *Mr. Lyell*. Sussex! *Mr. Borrer*. Kelvedon, Essex. *Mr. Varenne*.

CHANNEL ISLANDS :—Jersey and Guernsey. *Mr. Larchabastier*.

forma *rimatis*, (Fr.) *lirellæ linear-elongate, acuminate*, sessile, prominent, *minute*; epithecium *canaliculate*, margin elevated and inflexed.

On trees, frequent.

Not to be confounded with *O. Turneri*.

SYN :—Fries L. Ref. 365. (1831.) Nyl. Scan. 253. Mudd Man. 231.

EXS :—Leight. 192. Mudd 207.

GEOG. DISTRIB :—Sweden, France.

BOT. PROV :—1, 2...8...10...15...(19—30)...31.

ENGLAND :—Kildale! Yorkshire. *Mr. Mudd*. (saxicole) Fulking Roadside! Sussex. *Mr. Larchabastier*. Gopsall, Leicestershire. *Rev. A. Bloxam*. Lyndhurst! New Forest. *Rev. J. M. Crombie*. Red Hills, Exeter. *Mr. Parfitt*.

SCOTLAND :—Blair Athole. *Rev. J. M. Crombie*.

IRELAND :—Frequent. *Mr. Carroll*.

CHANNEL ISLANDS :—Noirmont; Beleroute Bay, Jersey. *Mr. Larchabastier*.

11. *O. Cascarensis*, Nyl. *white*, thin, *rimulose*, indeterminate; *lirellæ* black, *cylindrical*, prominent, *simple*, *subflesuose*; epithecium *rimiformi-constricted*; spores 8, colourless, *oblong*, 5-septate.

On quartzose rocks, rare.

SYN :—Nyl. in Flora 1868. p. 477. Crombie En. 99.

GEOG. DISTRIB :—Europe.

BOT. PROV :—31.

CHANNEL ISLANDS :—Noirmont, Jersey. *Mr. Larchabastier*.

12. *O. vulgata*, Ach. *greenish-white*, cartilagino-membranaceous, cracked and scaly, *effuse*; *lirellæ* prominent and sessile, *variable in size*, shorter ones roundish or oblong, longer ones slender and linear, *simple*, wavy and shining or greasy; epithecium *rimiform*, uniform.

proper margin thick, very round and inflexed ; spores 8, colourless, *fusiform*, 5-septate.

*forma vulgata*, Ach. *lirellæ* small, numerous, but regularly scattered ; *epithecium rimiform*, more or less expanded.

On various trees, common. 1807.

SYN:—Ach. Prodr. 21. (1798.) Syn. 73. Nyl. Scand. 255. Leight. Br. Graph. 23.

FIG :—E. Bot. 1811. Leight. Br. Graph. t. 5. f. 13. a. b.

EXS :—Bohl. 127. Schær. 516. Fries L. S. 280. (fide Nyl.) Leight. 194. Anzi It. S. 333. Mudd 211. Rabh. 820. Zw. 407.

GEOG. DISTRIB:—Sweden, Germany, France, Switzerland, Italy, Normandy, Belgium, Calcutta, Amazons, N. America.

BOT. PROV :—1, 2, 3...5...7...10, 11...14, 15...19...31.

ENGLAND :—Hurst and St. Leonard's Forest ; Sussex ! *Mr. Borrer*. New Forest. *Rev. J. M. Crombie*. Malvern Hills ! Worcestershire. *Mr. Lees*. Berwick-on-Tweed. *Dr. G. Johnston*. Easby Wood ! Cleveland. *Mr. Mudd*. Northumberland and Durham. *Mr. Winch*. Haldon, Exeter. *Mr. Parfitt*. Woodham Walter ; Braxted ; Messing, Essex. *Mr. Varcane*. Plymouth. *Mr. Holmes*. Haughmond Hill ! Weir Coppice ! Red Hill ! near Shrewsbury, Shropshire.

SCOTLAND :—Lasswade ! and near Edinburgh ! *Dr. Greville*. Killin. *Rev. J. M. Crombie*.

IRELAND :—Near Derrycrimlry ! *Mr. Carroll*.

WALES :—Bryn Maelgwyn ! near Conway, Carnarvonshire ; Penmaen mawr ! Torrent Walk, Dolgelley !

CHANNEL ISLANDS :—St. Peter's Valley, Jersey, and on all the Islands. *Mr. LARBALÉSTIER*.

*forma stenocarpa*, Ach. *lirellæ* long, slender and wavy, densely crowded ; *epithecium rimiform*, very narrow, closed.

On various trees, common.

SYN :—Ach. L. U. 257. (1810.) Syn. 75. Leight. Br. Graph. 24.

FIG :—Chev. Graph. t. 7. f. 5. c. t. 9. f. 1. Leight. Br. Graph. t. 5. f. 13. a. 1. b. 1.

EXS :—Zw. 6. 147. Schær. 93.

GEOG. DISTRIB :—Sweden, France, Germany, Switzerland, Italy, Bavaria.

BOT. PROV :—1, 2...5...7, 8...10...19...31.

ENGLAND :—Sussex ! *Mr. Borrer*. New Forest ! Hants. *Mr. Lyell*. Twycross, ! Leicestershire. *Rev. A. Bloxam*. Torquay ! Devon. *Dr. Deakin*. Airyholme Wood ! Newton ! Cleveland. *Mr. Mudd*. Stoke Wood, Exeter. *Mr. Parfitt*. Weir Coppice ! Shrewsbury ! Shropshire.

IRELAND :—Near Cork ! *Mr. Carroll*.

WALES :—Pen-maen-mawr !

CHANNEL ISLANDS :—St. Peter's Valley, Jersey. *Mr. LARBALÉSTIER*.

forma *subsiderella*, Nyl. *lirellæ radiato-ramose*.

On trees, rare.

SYN:—Nyl. Scand. 255.

FIG:—Chev. Graph. t. 7. f. 3. a.

EXS:—Nyl. 78. Mudd 212.

GEOG. DISTRIB:—France, Belgium.

BOT. PROV:—2, 3...5...7...10...19.

ENGLAND:—Near the Ham, Clayton! *Mr. Borrer*. Easby! Brantsdale! Yorkshire. *Mr. Mudd*. Kelvedon, Essex. *Mr. Varenne*. Red Hill! near Shrewsbury, Shropshire.

IRELAND:—Rockgrove! Cork. *Mr. Carroll*,

WALES:—Dolgelley!

forma *lithyrga*, Ach. thallus thin, white or whitish, continuous, *subfarinaceous*, subdeterminate.

On rocks, not common. 1849.

SYN:—Ach. L. U. 247. (1810.) Syn. 72. Nyl. Scand. 255.

EXS:—Zw. 3. 1. A. & B. Larbal. 43.

GEOG. DISTRIB:—Germany, Italy, Hungary.

BOT. PROV:—5...31.

ENGLAND:—Haughmond Hill! Shropshire. (1849).

CHANNEL ISLANDS:—L'Etacq Point; Noirmont, Jersey! *Mr. Larbalestier*.

forma *steriza*, Ach. pallido-ochraceous, very thin or *evanescent*; *lirellæ* simple, elongated, flexuose.

On rocks, not common. 1865.

SYN:—Ach. Syn. 72. (1817.) Nyl. Scand. 255.

EXS:—Nyl. 144, Zw. 30. 354. Rabh. 795. Larbal. 42.

GEOG. DISTRIB:—France, Switzerland, Germany, Italy.

BOT. PROV:—19...31.

IRELAND:—Croghan, Killarney. *Mr. Carroll*.

CHANNEL ISLANDS:—Noirmont!; Rozel, Jersey; Eperquerie, Sark. *Mr. Larbalestier*. (1865).

#### \*\*\*\* *Spores 7-septate.*

13. *O. Leightonii*, Crombie in litt. *chalky-white*, *pulverulent*; *lirellæ* *prominent*, rigid, straight or stellato-divergent, *tapering towards each extremity*; *epithecium* at first rimiform, then *dilated*; *proper margin thin, elevated*; spores 8, colourless, fusiform, 7-septate, (sometimes 5 and 6.)

On calcareous and sandstone rocks, frequent. 1807.

Mr. Crombie has found in Sowerby's Herb. in Brit. Mus. the identical specimen of *Opegrapha calcarea* from Mr. D. Turner, duly named, localized and marked as drawn in Eng. Bot. On examination and comparison, it proves to be identical with *O. Chrevallieri*, (Leight. Br. Graph. t. 5. f. 4.) having spores broadly clavate, round

ed at each extremity, 3-septate. He proposes therefore to name the *Opeg. saxatilis*, Leight. Br. Graph., *Opegrapha Leightonii*, Crombie.

SYN:—*O. saxatilis*, Leight. Br. Graph. 9. excl. syn. *O. rimalis septennaria* Nyl. !

FIG:—Leight. Br. Graph. t. 5. f. 3.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1, 2...4, 5...7.. 10, 11.. 19...31.

ENGLAND:—Netley Abbey! *Mr. Lyell*. Stone Farm rocks, Ardingly! Sussex. *Mr. Borrer*. Norfolk and Suffolk. *Sir J. E. Smith*. Newton Wood! Cleveland. *Mr. Baker*. Great Ayton! Yorkshire. *Mr. Dixon*. Ilsham! Torquay, Devon. *Dr. Deakin*. near Whitburn, Sunderland and Castle Eden, Durham; Wycliffe Church. *Mr. Winch*. Aymestry! Herefordshire.

IRELAND:—Killarney! *Mr. Hardy*.

WALES:—Great Orme's Head!

CHANNEL ISLANDS:—La Coupe, Jersey. *Mr. Larbalestier*.

14. *O. lyncea*, (Sm.) *white*, tartareous, pulverulent; *lirellæ black*, immersed, oblong or linear-oblong, rounded at each end, simple, curved; *epithecium plane*, dilated, *cæcio-pruinose*; *proper margin stout*, elevated, wavy; spores 8, colourless, fusiform, 7-septate.

On old oaks, not common. 1795.

SYN:—Smith in E. Bot. 809. (1800.) Leight. Br. Graph. 47. Nyl. Prodr. 151.

FIG:—E. Bot. 809. Leight. Br. Graph. t. 7. f. 25.

EXS:—M. & N. 1158. Bohl. 93. Zw. 422. Nyl. 71. Mudd 204. Leight. 195.

GEOG. DISTRIB:—Switzerland, France, Germany, Sweden, Italy, Brazils.

BOT. PROV:—1, 2, 3, 4, 5...8...10, 11...31.

ENGLAND:—Hainault Forest, Essex. *Mr. Sowerby*. (1795.) near Windsor. *Mr. Turner*. Sussex! *Mr. Borrer*. New Forest! Hants. *Mr. Lyell*. Oswestry! Shropshire. *Rev. T. Salwey*. on the Bear's Oak! at Penshurst, Kent. *Mr. Thompson*. Northamptonshire. *Prof. Churchill Babington*. Hartshill Wood! near Atherstone; Donnington Park! Leicestershire. *Rev. A. Bloam*. Thorndon Hall Park Essex. *Mr. Piggott*. Great Malvern! Worcestershire. *Mr. Lees*. Hoggarts Wood! Cliffrigg! Cleveland. *Mr. Mudd*. near Bishop Auckland, Durham. *Rev. J. Harriman*. near Thirsk, Yorkshire. *Mr. Baker*. Topsham and Haldon, Exeter. *Mr. Parfitt*. Rivenhall; Kelvedon; Braxted, Essex. *Mr. Varenne*. Epping Forest. *Rev. J. M. Crombie*. Haughmond Hill! Shropshire.

CHANNEL ISLANDS:—Jersey and Guernsey. *Mr. Larbalestier*.

\*\*\*\*\* *Spores multi-septate.*

15. *O. amphotera*, Nyl. *pale-dusky-yellow* or tawny, thin, *sub-tartareous*, slightly rimose, somewhat pulverulent; *lirellæ black*, very variable in size and shape, numerous



and crowded, round, oblong, linear-oblong and linear-elongate, simple, acuminate; epithecium broad, plane; proper margin thin, elevated, prominent, flexuose; spores 8, colourless, acicular, 6-9-septate; paraphyses few, slender, distinct; spermatia shortly cylindrical, slightly curved, different from *O. vulgata*.

On Scotch fir, rare. 1866.

SYN:—Nyl. in Flora 1866. p. 374. Leight. in Ann. and Mag. N. Hist. June 1867. *O. dubia*, Leight. Exs. 312.

EXS:—Leight. 381. 312.

GEOG. DISTRIB:—Europe.

BOT. PROV:—7.

WALES:—Side of the Bala turnpike road, about  $\frac{3}{4}$  mile from Dolgelly! (July 1866).

16. *O. prosodea*, Ach. dirty, pallido-fuscescent, cartilagineo-membranaceous, effuse; lirellæ sessile, thick, subcylindrical, somewhat shining, straight; epithecium rimiform; proper margin connivent, elevated, subcarinate; spores colourless, elongato-fusiform, 11-13-septate; paraphyses distinct, stout; perithecium carbonaceous, thick, entire.

On oaks and beech, rare.

SYN:—Ach. Meth. 22. (1803.) Syn. 74. Nyl. Addit. N. Gran. 568.

EXS:—Spruce L. Amaz. 67. Larbal. 92.

GEOG. DISTRIB:—Amazons, Brazils.

BOT. PROV:—31.

CHANNEL ISLANDS:—Ann Port; St. Peter's Valley, Fliquet Bay; Beleroute Bay, Jersey! Mr. *Larbalestier*.

17. *O. viridis*, Pers. pale-dusky-yellow, thin, subtartareous, rimose, limitate; lirellæ small, innate, rounded, oblong or linear, straight or curved, chiefly simple; epithecium rimiform, uniform; proper margin rounded, inflexed; spores 8, colourless, elongato-fusiformi-acicular, 13-septate.

On trees, rare.

SYN:—Pers. in Ach. Meth. 22. (1803.) Nyl. Scand. 256. *O. siderella*, Leight. Br. Graph. 24.

FIG:—Leight. Br. Graph. t. 6. f. 14

EXS:—M. & N. 648. Schær. 96. Hepp 164.

GEOG. DISTRIB:—France, Germany, Sweden, Ceylon.

BOT. PROV:—1, 2...10...19.. 31.

ENGLAND:—New Forest! Hants. Mr. *Lyell*. Hoggarts Wood; Ingleby Park, Cleveland. Mr. *Mudd*. Dunsford, Exeter. Mr. *Parfitt*.

IRELAND :—Castlebernard Park, Bandon. *Adm. Jones*. Castle-martyr ; Turk, Dinis, and Cromaglow, Killarney ; Eagle's Nest. *Mr. Carroll*.

CHANNEL ISLANDS :—St. Peter's Valley, Jersey. *Mr. Larbalestier*.

*forma taxicola*, Leight. *pale-yellowish-grey, pulverulent, effuse ; lirellæ large, excessively prominent and sessile, oblongo-linear or lineari-elongate, straight or curved, chiefly simple, scattered or congregated ; epithecium broadly rimiform ; proper margin rounded, inflexed, rugged ; spores 8, colourless, elongato-fusiformi-acicular, 13-septate.*

On yew, rare. 1853.

SYN :—Leight. Br. Graph. 25.

FIG :—Leight. Br. Graph. t. 6. f. 15.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2...8...31.

ENGLAND :—Funtington church yard ! ; Hunston church yard ! Aldingbourne church yard ! Sussex. *Mr. Borrer*. (1853.) Twycross, Leicestershire. *Rev. A. Bloxam*, Church yard, Hayling Island, Hants. *Mr. Larbalestier*.

CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier*.

## V. PLATYGRAPHIA, *Nyl.*

Thallus thin or obsolete. Apothecia black, plane, simple, immarginate or surrounded with a shining thalline margin. Spores 8, colourless, fusiform, septate. Spermatia shortly cylindrical, straight or slightly curved.

1. *Pl. rimata*, (Fw.) *white, tartareous, thin, rimose, verruculose ; apothecia lirellæform, fuscous-black, impressed in the verrucæ, simple or branched, straight or wavy, either acute at the extremities or obtuse and rounded, broad and expanded, plano-convex, shining, surrounded with a spurious narrow whitish thalline margin ; hypothecium nigro-fuscous, thick ; paraphyses distinct ; spores 8, colourless, aciculari-fusiform, curved, 3-septate.*

On ash trees, rare.

SYN :—Flot. L. Exs. 438. B. (1829.) *Nyl. Prodr.* 162. *Chiodetion graphidioides*, Leight. Br. Graph. 51.

FIG :—Leight. Br. Graph. t. 7. f. 29.

EXS :—Welw. Lusit. 89. (in part).

GEOG. DISTRIB :—France, Portugal, N. Granada, Canaries.

BOT. PROV :—5...23.

ENGLAND :—Near Sharpstones Hill ! Shropshire.

IRELAND :—Loughlinstown ! *Herb. Borrer*.

VI. STIGMATIDIUM, *Mey.*

Thallus distinct, crustaceous, thick. Apothecia punctiform or elongated, slender, aggregate or single, immersed, internally entirely whitish; hypothecium colourless. Spores elongato-fusiform. Spermatia straight, shortish.

1. *St. crassum*, Dub. *greyish-white, olive or brownish-olive*, determinate, *decussate* with blackish lines, crustaceous, *thickish and turgid*, smooth and polished, contiguous or rimulose; *apothecia brownish-black*, numerous, *very minute, punctiform*, slightly convex, immarginate, *solitary or confluent in flexuose radiate lines*, deeply immersed; spores 8, colourless, fusiform, 5-septate.

On trees, not uncommon. 1807.

SYN:—Duby Bot. Gall. p. 643. (1830.) Nyl. Prodr. 163. *Sagadia aggregata*, Leight. Ang. Lich. p. 24.

FIG:—E. Bot. 1752. Leight. Ang. Lich. t. 8. f. 1.

EXS:—M. & N. 955. Schaer. 587. Leight. 69. Mudd 224. Bohl. 116. Larbal. 45. 46. Welw. Lusit. 89. in part.

GEOG. DISTRIB:—France, Germany, Algeria.

BOT. PROV:—1, 2...5, 6, 7, 8...10...(19—30)...31.

ENGLAND:—New Forest, Hants. *Mr. Lyell*. (1807.) Sussex. *Mr. Borrer*. Bery Castle! Totness, Devon. *Dr. Deakin*. Westerdale! Newton Wood! Cleveland. *Mr. Mudd*. near Thirsk, Yorkshire. *Mr. Baker*. near Exeter, Devon. *Mr. Parfitt*. New Forest and Epping Forest. *Rev. J. M. Crombie*. near Malvern, Worcester; S. Devon and Cornwall. *Dr. Holl*. Stoke Wood, Exeter. *Mr. Parfitt*. near Twycross, Leicestershire. *Rev. A. Bloxam*. Plymouth. *Mr. Holmes*.

IRELAND:—On old trees, common. *Mr. Carroll*.

WALES:—Cherriton Church-yard! Pembrokeshire. *Rev. T. Salwey*. Gloddaeth! near Conway.

CHANNEL ISLANDS:—Ann Port! Jersey. (saxicole) Rozel! and La Coupe! and all the Islands. *Mr. Larbalestier*.

2. *St. circumscriptum*, (Tayl.) *glaucous-white, thick, tartareous*, sub-determinate or effuse, even, *sub-pulverulent, rimulose*; *apothecia brownish-black*, very minute, *punctiform, innate, obovate or clavate*, crowded and congregated, solitary, *distinct or lineari-confluent*, plane or slightly convex, pruinose or naked, immarginate, internally pale; spores 8, *fuscous, narrowly obovate or clavate, 5-septate*.

On shaded rocks, very rare. 1836.

SYN:—*Verrucaria*, Tayl. Fl. Hib. 2. 96. (1836.) *Sagadia*. Leight. Angioc. Lich. 24.

FIG:—Leight. Ang. Lich. t. 8. f. 3.

EXS:—Mudd 239.

GEOG. DISTRIB:—France.

BOT. PROV:—1.. 10. 19...30, 31.

ENGLAND:—Airyholme Wood, Cleveland. *Mr. Mudd*. Mouth of Tamar, Devonport! *Mr. Holmes*.

IRELAND:—Kerry! *Dr. Taylor*. co. Antrim. *Dr. Moore*.

CHANNEL ISLANDS:—La Coupe; Rozel Valley! Jersey. *Mr. Lerbalestier*.

3. *St. venosum*, (Ach.) *dirty-cream-colour*, tartareous, nigro-fusco-limitate, smooth, continuous, *in turgescant patches*; apothecia *lirellæform*, dark-reddish-brown, *innate*, slender, *variously branched*, *flexuose*, *plano-convex*, dilated, naked, *immarginate*, with a pale spurious narrow *thalline margin*, internally pale; spores 8, colourless, *elongato-acicular*, 13-septate.

On old trees, rare.

SYN:—*Opegrapha*, Sm. E. Bot. 2454. (1812.) *Platygramma elaborata*, (Lyell Mss. in herb. Borrer.) Leight. Br. Graph. 50.

FIG:—E. Bot. t. 2454. Leight. Br. Graph. t. 7. f. 27.

GEOG. DISTRIB:—Europe.

BOT. PROV:—2.. 25.

ENGLAND:—New Forest! Hants. *Mr. Lyell*. Quarr Abbey Wood! near Ryde, Isle of Wight. *Rev. A. Bloxam*. near Brockenhurst in New Forest. *Rev. J. M. Crombie*.

IRELAND:—Glenstall co. Tipperary. *Mr. Carroll*.

4. *St. Hutchinsiae*, Leight. *dull-pale-yellow*, thin, crustaceous, nigro-limitate, *continuous*, *minutely rimulose*; apothecia *lirellæform*, dark-brown, each *innate in an elevated thalline verruca which forms a spurious narrow paler margin*, variable, round and minute, oblong, linear, more or less branched, straight or curved and *flexuose*, plane, dilated, *immarginate*; excipulum lateral, brown; spores 8, colourless, fusiform, 5-7-or pluri-septate.

On shaded rocks, not common. 1853.

SYN:—Nyl. Enum. 132. (1858.) *Platygramma Hutchinsiae*, Leight. Br. Graph. 49. (1854).

FIG:—Leight. Br. Graph. t. 7. f. 28.

EXS:—Leight. 130. Mudd 225. 226. Zw. 392. B. Arn. 293.

GEOG. DISTRIB:—Europe, Germany.

BOT. PROV:—1...10, 12...19...31.

ENGLAND:—Keswick! Cumberland. *Herb. Borrer*. Newton rocks;

Pinchingthorp Wood! Airyholme Wood; Beech Bank, Kildale! Cleveland. *Mr. Mudd*. Whitesand, Cornwall. *Rev. J. M. Crombie*. near Derwentwater! *Mrs. Stanger*, Ayton! Yorkshire. *Mr. Baker*. near St. German's, Cornwall. *Dr. Holl*. Plymouth. *Mr. Holmes*.

IRELAND:—Near Bantry! *Miss Hutchins*. Carig Mountain, Kerry. *Dr. Taylor*. Blackwater Bridge, Kerry. *Adm. Jones*. Duncomb's Wood, Cork; Dinis Island (and also f. corticole), Muckruss Demesne; Island in Upper Lake, Killarney. *Mr. Carroll*.

CHANNEL ISLANDS:—St. Peter's Valley; Gargate Mill Valley! Jersey. *Mr. LARBALÉSTIER*.

## VII. ARTHONIA, *Ach.*

Thallus thin or hypophlæodal and evanescent. Apothecia (*ardellæ*) roundish or diffused, plane or tumid, innately sessile, immarginate; thalamium sub-gelatinous, without paraphyses; asci pyriform; spores 4-8, colourless, rarely brown, obovate, septate, upper cell larger. Spermatia cylindrical, straight or curved.

### \* Spores 1-septate.

1. *A. lurida*, *Ach.* pale-dirty-brown or lead-colour, indeterminate, effuse. smooth, obsolete; *ardellæ* reddish-black, sessile, appressed, irregularly roundish, slightly convex, dull, internally concolorous; spores 8, colourless, broadly obovate, 1-septate, small.

On trees, not common. 1837.

SYN:—*Ach.* L. U. 143. (1810.) Syn. 7. Nyl. Scand. 258. Leight. Br. Graph. 57.

FIG:—*E. Bot. Suppl.* 2692. f. 2. Leight. Br. Graph. t. 8. f. 38.

ENS:—*Schaer.* 17. *Mudd* 236. *Zw.* 86. *M. & N.* 1325. *Th. M. Fries* 47. *Hepp* 161. *Leight.* 17.

GEOG. DISTRIB:—France, Switzerland, Germany, Russia, Scandinavia.

BOT. PROV:—2...5...8...10 . 19...31.

ENGLAND:—Black Down, Sussex! *Mr. Borrer*. (1837) New Forest! Hants. *Mr. Lyell*. Orton Wood! Leicestershire. *Rev. A. Blooram*. Airyholme Wood! Cliffrigg! Newton Wood! Cleveland. *Mr. Mudd*. Leigh Woods, Clifton. *Mr. LARBALÉSTIER*.

IRELAND:—Killarney. *Sir T. Gage*. Ardtully co. Kerry. *Dr. Taylor*.

CHANNEL ISLANDS:—Rozel, Jersey. *Mr. LARBALÉSTIER*.

2. *A. vinosa*, *Leight.* bright-pale brown, thin, membranaceous, smooth, sub-determinate; *ardellæ* deep-vinous red, minute, irregularly roundish, variable in size, single or confluent, sessile, convex, dull, internally concolorous.



ous ; spores 8, colourless, obovate, 1-septate, *double the size of those of A. lurida*.

SYN :—Leight. in Ann. and Mag. N. Hist. Oct. 1856.

FIG :—Leight. l. c. t. 11. f. 6. 7. 8. 9. 10.

EXS :—Leight. 224. Mudd 235.

GEOG. DISTRIB :—France.

BOT. PROV :—2, 3...5...10...19.

ENGLAND :—Newton Wood ! Stogdale ! Oggeray Gill ! Cleveland. *Mr. Mudd*. (1856.) Hickmore Fen Wood ; Pod's Wood, Messing, Essex. *Mr. Varcene*. New Forest. *Rev. J. M. Crombie*. Nesscliffe Hill ! Shropshire.

IRELAND :—Castlebernard ! *Mr. Carroll*.

Var. *pineti*, Körb. *glauco-rufescent*, very slightly leprose, unequal ; *ardellæ reddish-black* or black, *minute*, crowded, *difformed*, *angular or sub-stellate*, plane ; spores 4-6, colourless, at length *fuscescent*, obovate, 1-septate, as in *vinosa*.

On trees in sub-alpine localities. rare.

SYN :—Körb. S. L. G. 292. (1855.) Nyl. Scand. 261.

FIG :—Hepp Sporen t. 64. f. 558.

EXS :—Hepp 558. Arn. 243 Zw. 309.

GEOG. DISTRIB :—Germany, Scandinavia.

BOT. PROV :—19...22...24, 25, 26.

IRELAND :—Glencar, Kerry ; Loughcooter, Galway ; Luggela co. Wicklow ; Eagle's Nest, Killarney ; co. Cork ; *Mr. Carroll*. Clonmel. *Mr. Wright*.

3. *A. patellulata*, Nyl. *whitish*, indeterminate ; *ardellæ black, rotundate, appressed*, plane, scattered, *immarginate*, internally nigricant ; spores 8, colourless, obovate, 1-septate, *small* ; hypothecium obscure at the base.

On poplars, rare.

SYN :—Nyl. in Bot. Notis. 1853. p. 95. Nyl. Scand. 262. Crombie En. 105.

FIG :—Fellm. 209. 210.

GEOG. DISTRIB :—Sweden, Finland, Lapland.

BOT. PROV :—24, 28.

IRELAND :—Armagh Demesne. *Adm. Jones*. Carrigogunnel ; Castleconnel near Limerick. *Mr. Carroll*.

4. *A. melaspermella*, Nyl. *pallescent*, effuse or evanescent ; *ardellæ black or fuscous-black, rotundate, lecideiform*, plane, small, margined, *margin sub-crenulate*, at length evanescent ; spores 8, fusco-nigrescent, oblongo-ovoid, 1-septate.

On old wood, rare. 1866.

SYN :—Nyl. in Flora 1855. Crombie En. 105.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2.

ENGLAND :—Near London! *Mr. Currey*. (1866).

5. *A. excipienda*, Nyl. *cinerascens*, whitish, determinate; *ardellæ* slender, oblong, punctiform or *flexuoso-irregular*, plane; spores 8, colourless, minute, obovate, 1-septate.

On trees, very rare. 1867.

SYN :—Nyl. Scand. 261. Crombie En. 104.

GEOG. DISTRIB :—Aland, Finland.

BOT. PROV :—19.

IRELAND :—Base of Mangerton! (1867.) Turk, Mangerton, Killarney. *Mr. Carroll*.

6. *A. lapidicola*, (Tayl.) *fusco-olivaceous*, thin, *furfuraceous*; *apothecia* black, *rotundate* or *rotundato-diformed*, appressed, plane, immarginate, internally nigricant; spores 6-8, colourless, obovate, 1-septate.

On calcareous rocks and stones, rare. 1836.

SYN :—*Lecidea lapidicola*, Tayl. Fl. Hib. 2. 124. (1836.) *Arthonia ruderalis*, Nyl. Scand. 262. *Arthonia fusca*, Mass. Ric. 80.

FIG :—Hepp Sporen t. 62. f. 534.

EXS :—Leight. 398. Hepp 534. Anzi Venet. 86.

GEOG. DISTRIB :—Bavaria, Italy, Sweden.

BOT. PROV :—2...5, 6...15...19...30.

ENGLAND :—Fairlight near Hastings! Hale's End, Malvern! *Dr. Holl*.

SCOTLAND :—Ben Lawers. *Adm. Jones*.

IRELAND :—Co. Down. *Mr. Templeton*. Cappamore! near Dunkerron co. Kerry. *Dr. Taylor*.

WALES :—Pandy near Abergavenny co. Monmouth. *Dr. Holl*.

7. *A. spadicea*, Leight. *pale-red-brown*, obsolete, smooth, shining; indeterminate, *ardellæ* dull-brownish-black, flat or tumid, smooth, sessile, variable in size, larger ones roundish or oblong, smaller round and punctiform; spores 8, colourless, slenderly claviform, or linear-obovate, small, 1-septate, cells nucleolate, the lower cell frequently elongated and containing two round nucleoli, which give the spore the appearance of being 2-septate or 3-ocular.

On hazel, hawthorn, &c. rare. 1852.

SYN :—Leight. Br. Graph. 57. (1854).

FIG :—Leight. Br. Graph. 57, t. 8. f. 39.

EXS :—Leight. 97. Nyl. 86.

GEOG. DISTRIB:—France.

BOT. PROV :—1...5...8...10...19...31.

ENGLAND :—Gopsall ! Leicestershire. *Rev. A. Bloxam*. Yorkshire ! *Mr. Dixon*. Newton Wood ! Cleveland. *Mr. Mudd*. Leigh Woods, Clifton. *Mr. Lorbalestier*. Stoke Wood, Exeter. *Mr. Parfitt*. Shelton Rough ! near Shrewsbury, Shropshire. (1852).

IRELAND :—Ballyedmond and Glenbower Woods co. Cork. *Mr. Carroll*.

CHANNEL ISLANDS :—Rozel, Jersey. *Mr. Lorbalestier*.

**\*\* Spores 3-septate.**

8. *A. ochracea*, (Duf.) *pallescent*, very thin ; *ardellæ* *darkly-ochraceous*, depressed, lobato-difformed or substellate ; spores 8, colourless, obovate, 3-septate.

On trees, rare. 1864.

SYN :—Dufour in Journ. Phys. 87. p. 205. (1818.) Nyl. Prodr. 164.

FIG :—Mass. Ric. fig. 83.

EXS :—M. & N. 470. Zw. 308. Mass. 14. Anzi 317.

GEOG. DISTRIB :—France, Switzerland, Italy, Germany.

BOT. PROV :—19.

IRELAND :—Glencar, Kerry. *Mr. Carroll*. (1864).

9. *A. Cascarillæ*, (Fée.) *pallido-glaucous*, very thin ; *ardellæ* *blackish* or *fuscous-black*, minute, simple, oblong or lineari-oblong or irregularly difformed by confluence, plane ; spores 8, colourless, obovate, 3-septate.

On trees, rare. 1864.

SYN :—*Conicarpon*, Fée Ess. 99. (1824.) Suppl. 94.

FIG :—Fée Ess. t. 7. f. 4. & 4. a. Suppl. t. 42. f. 3.

GEOG. DISTRIB :—Central America.

BOT. PROV :—19.

IRELAND :—Glencar ! Kerry. *Mr. Carroll*. (1864).

The specimens I have seen do not resemble Fée's figures of the plant itself, nor of the spores which he figures as having 4-5 septa, and describes as with "*quatre cloisons*." The spores in the Irish plant were obovate, 3-septate, in size and form precisely as in *A. ochracea*, Duf. The Irish specimens were so named by Nylander.

10. *A. myriocarpella*, Nyl. *pale-ashy-grey*, thin, opake, sub-areolate, sub-pulverulent, effuse or evanescent ; *ardellæ* *fuscous-black* or *black*, rotundate, lecideiform, superficial, minute, plane or convex, immarginate, internally nigricant ; spores 8, colourless, oblongo-ovoid, 3-septate.

On micaceo-schistose rocks, rare.

SYN :—Nyl. N. Gran. 2. 107. (1864.) Crombie En. 104.

GEOG. DISTRIB :—N. Granada.

BOT. PROV :—15.

SCOTLAND :—Aviemore in Strathispey. *Adm. Jones.*

11. *A. aspersa*, Leight. *pale-opake, greyish-green*, thin, membranaceous, smooth, indeterminate; *ardellæ dull-black*, minute, *copiously sprinkled*, sessile, various in form, punctiform, roundish, oblong, ovate, angular or irregular, depressed or convex, internally fuscous; *spores* 8, colourless, *obovate*, 3-septate, small, *upper cell largest, occupying nearly half of the spore, the septa in the lower portion.*

On holly, rare. 1854.

SYN :—Leighton in Ann. and Mag. Nat. Hist. Oct. 1856. Mudd Man. 248.

FIG :—Ann & Mag. N. Hist. 1856. t. 11. f. 11. 12. 13. 14. 15.

EXS :—Leight. 248.

GEOG. DISTRIB :—Normandy.

BOT. PROV :—10...13.

ENGLAND :—Farndale; Baysdale!; Hobhole! Cleveland. *Mr. Mudd.* (1854).

IRELAND :—Cromaglow Mountain, Killarney! *Mr. Carroll.*

12. *A. punctiformis*, Ach. *copper-coloured*, thin, membranaceous, smooth, shining, indeterminate; *ardellæ dark-brown*, plane or slightly convex, rough, *sub-innate*, scattered, roundish or broadly oblong, simple, internally pale; *spores* 8, colourless, *lineari-clavate*, or obovate, *obtusely pointed*, 3-septate.

On trees, rare.

SYN :—Ach. L. U. 141. (1811.) Syn. 4. Leight. Br. Graph. 53.

FIG :—Leight. Br. Graph. t. 7. f. 31.

EXS :—Mudd. 231. Anzi Ven. 90. 91. Anzi Langob. 265.

GEOG. DISTRIB :—Scandinavia, Italy, Hungary.

BOT. PROV :—1, 2, 3...10 ..19...31.

ENGLAND :—Sussex! *Mr. Borrer.* Hoggarts Wood! Ingleby; Baysdale! Cleveland. *Mr. Mudd.* Torquay! Devon. *Dr. Deakin.* Braxted; Kelvedon, Essex. *Mr. Varcane.* New Forest. *Rev. J. M. Crombie.*

IRELAND :—Lermount! near Cork. *Mr. Carroll.*

CHANNEL ISLANDS.—Common on all the Islands. *Mr. Larbales tier.*

forma *galactina*, Ach. thallus pale-yellow or cream-colour.

On young oaks, rare.

SYN :—Ach. L. U. 141. Syn. 4. Leight. Br. Graph. 53.

FIG :—Leight. Br. Graph. t. 7. f. 31.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1, 2...4...19...31.

ENGLAND :—Sussex ! *Mr. Borrer*. Torquay ! Devon. *Dr. Deakin*. Comberton Wood near Cambridge. *Mr. LARBALSTIER*. New Forest. *Rev. J. M. Crombie*.

IRELAND :—Dunscombe's Wood ! Cork. *Mr. Carroll*.

CHANNEL ISLANDS :—St. John's, Jersey. *Mr. LARBALSTIER*.

Var. *melantera*, Ach. *fusco-nigricant* or copper-coloured ; *ardellæ* immersed, oblong, elongate and diffomed, somewhat concave.

On trees, rare. 1867.

SYN :—*Arthonia obscura* var. *melantera*, Ach. Syn. 7. (1817).

GEOG. DISTRIB :—Sweden.

BOT. PROV :—31.

CHANNEL ISLANDS :—Noirmont Manor, Jersey. *Mr. LARBALSTIER*. (1867).

13. *A. astroidea*, Ach. *white, cream-colour or olive*, thin, membranaceous, smooth, scaly, *determinate* ; *ardellæ* *blackish or dark-brown*, plane, rough, *innate, clustered, substellate or radiate, internally pale* ; spores 8. colourless, *lineari-clavate*, roundish at the extremities, 3-septate.

On trees, frequent.

SYN :—Ach. Meth. 25. (1803.) Syn. 6. Nyl. Scand. 259. Leight. Br. Graph. 53.

FIG :—E. Bot. 1847. Leight. Br. Graph. t. 8. f. 32.

EXS :—Leight. 289. Fries 24. (fide Nyl.) Fellm. 207. Mudd 227. Schær. 16.

GEOG. DISTRIB :—Sweden, Lapland, Switzerland, France, Belgium, Italy, Portugal.

BOT. PROV :—1, 2, 3...5...7.. 10, 11...15...19...31.

ENGLAND :—Sussex ! *Mr. Borrer*. Berwick-on-Tweed. *Dr. G. Johnston*. Cliffrigg ! Cleveland. *Mr. Mudd*. Haldon, Exeter. *Mr. Parfitt*. Braxted, Essex. *Mr. Varcune*. Midland Counties. *Mr. Purton*. Haughmond Hill ! Bomere Pool ! near Shrewsbury, Shropshire.

SCOTLAND :—Woods opposite Birnam, Dunkeld ! ; Glen Shee ! Perthshire ; Glen Nevis ! Invernessshire ; Kinnoull Hill ! Perth. *Dr. Lindsay*.

IRELAND :—Cromaglow ! Killarney. *Mr. Carroll*.

WALES :—Bettws-y-Coed Church-yard ! Wood opposite Tanybwlic Hotel, Capel Curig ! Craig Breidden !

CHANNEL ISLANDS :—Common on all the Islands. *Mr. LARBALSTIER*.



Var. *epipastoides*, Nyl. *ardellæ* minute, irregularly flexuose, slender, oblong, or punctiform; spores 3-4-septate.

On ivy, rare. 1869.

SYN:—Nyl. Scand. 259. (1861.) Crombie En. 103.

GEOG. DISTRIB:—France.

BOT. PROV:—19.

IRELAND:—Killarney. Mr. Hardy. Eagle's Nest! Glenbower Wood! Killeagh co. Cork. Mr. Carroll.

Var. *opegraphina*, Ach. *ardellæ* depressed, linear, simple or crowded, substellato-difformed, rough; spores 3-4-septate.

On trees.

SYN:—Ach. Syn. 6. (1817.) Crombie En. 103.

GEOG. DISTRIB:—Sweden.

BOT. PROV:—19.

IRELAND:—Glenbower Wood! co. Cork. Mr. Carroll.

14. *A. epipasta*, (Ach.) grey or copper-colored, thin, membranaceous, smooth, shining, irregularly circumscribed; *ardellæ* dark-brown, plane, roughish, innate, scattered, oblong or elongato-oblong, simple or branched, internally pale; spores 8, colourless, lineari-clavate, 3-septate, double the size of those of *A. astroidea*.

On trees, not common. 1807.

SYN:—*Opegrapha*, Ach. Meth. 26. (1803.) Syn. 75. Leighton Br. Graph. 51.

FIG.—E. Bot. 1911. Leighton Br. Graph. t. 7. f. 30.

EXS:—Mudd 230. M. & N. 359. Anzi Langob. 208.

GEOG. DISTRIB:—Germany, Hungary, Lombardy.

BOT. PROV:—2, 3, 4 ..7...10.. 31.

ENGLAND:—Thorpe near Norwich. Sir J. E. Smith. (1807.) Yarmouth. Mr. Turner. Sussex! Mr. Borrer. Cliffrigg! Hoggets Wood! Ingleby, Cleveland. Mr. Mudd. Braxted, Essex. Mr. Farrow.

WALES:—Festiniog road, Dolgelley!

CHANNEL ISLANDS:—Common on all the Islands. Mr. Larches-tier.

15. *A. Swartziana*, Ach. pale yellow, cream-colour or ashey-grey, thin, cartilagineo-membranaceous, sealy, subdeterminate; *ardellæ* black, plane, irregularly cracked, sub-sessile, clustered into irregular angular or sub-radiate shapes, internally brownish; spores 8, colourless, very broadly obovate, 3-septate.

On trees, frequent. 1809.

SYN:—Ach. in Schrad. Journ. Bot. 1. 3. p. 13. (1806.) Syn. 5. Leight. Br. Graph. 54.

FIG:—E. Bot. 2079. Leight. Br. Graph. t. 8. f. 33.

EXS:—Schær. 462. Anzi It. S. 323. Mudd 228. Leight. 70.

GEOG. DISTRIB:—Switzerland, Hungary, Germany.

BOT. PROV:—1, 2, 3...5...7...10, 11...15...19.

ENGLAND:—Sussex! *Mr. Borrer*. (1809.) near the Retreat, Berwickshire! *Dr. G. Johnston*. Cliffrigg! Shattershelf! Airyholme Wood! Cleveland. *Mr. Mudd*. Kings Kerswall, Newton, Devon. *Mr. Parfitt*. Tiptree; Feering; Beckingham, Essex. *Mr. Varenne*. Midland Counties. *Mr. Purton*. Plymouth. *Mr. Holmes*. Montford Bridge! Nesscliffe Hill! Shropshire.

SCOTLAND:—Will's Braes, Forfarshire. *Mr. Gardiner*.

IRELAND:—Castlebernard Park! co. Cork. *Mr. Carroll*.

WALES:—Moel-y-Golfa! Montgomeryshire; Festiniog road, Dolgelly!

16. *A. trachylioides*, Nyl. cream-colour, more or less tinged with rose, rather thick, contiguous, smooth, subsequently leproso-pulverulent, effuse or sub-determinate; *ardellæ* black, small, very numerous, sessile, rounded, solitary, rarely confluent, plano-convex, immarginate, nigro-pulverulent and rugose when old; spores 6-8, colourless, obovate, or lineari-clavate, the extremities rounded, 3-septate.

On sub-alpine rocks, very rare. 1861.

SYN:—Nyl. Enum. Gen. 133. (1858.) Mudd Man. 251.

FIG:—Mudd Man. t. 4. f. 98.

EXS:—Mudd 237.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1...10.

ENGLAND:—Farndale; Highcliff; Ingleby Park; Yorkshire. *Mr. Mudd*. Chudleigh, Devon. *Mr. Parfitt*.

\*\*\* *Spores 4-septate.*

17. *A. cinnabarina*, (Wallr.) greyish, filmy, thin, determinate; *ardellæ* lurid and pruinose, or powdery and of a bright vermilion, sessile, clustered, diffringed, solid, plane, depressed; spores 8, pale red, obovato-clavate, rounded at the extremities, 4-septate, upper cell largest.

On old trees, frequent.

SYN:—Wallr. Crypt. Germ. 320. (1831.) Nyl. Scand. 257. Leight. Br. Graph. 58.

GEOG. DISTRIB:—Normandy, Germany, Italy, Portugal, Switzerland, Pyrenees, France, Ceylon, Calcutta, Amazon, S. America.

BOT. PROV :—1, 2, 3...5...10, 11...19...24...31.

A very variable lichen of which the chief varieties and forms may be distributed as follows :—

Var. *kermesina*, Nyl. *ardellæ* and thallus *vermilion-coloured*. Nyl. Scand. 257.

f. *cinnabarina*, T. & B. *ardellæ* somewhat convex, pulverulent, vermilion-coloured. Leight. l. c. 59.

Exs :—Leight. 249. M. & N. 651. Schaer. 239. Arn. 150. Welw. Lusit. 25. Anzi It. S. 318. Hepp 162.

FIG :—E. Bot. 2151. Leight. Br. Graph. t. 8. f. 40.

BOT. PROV :—1, 2, 3...5...10, 11...31.

ENGLAND :—Sussex ! *Mr. Borrer*. New Forest. *Rev. J. M. Crombie*. Airyholme Wood ! Yorkshire. *Mr. Mudd*. Haldon, Exeter. *Mr. Parfitt*. Easthorpe ; Rivenhall ; Woodham Walter, Essex. *Mr. Varenne*. Plymouth. *Mr. Holmes*.

SCOTLAND :—Pease Bridge ! Berwickshire. *Dr. G. Johnston*.

CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier*.

f. *rosacea*, T. & B. *ardellæ* collected into clusters, lobate, pulverulent, vermilion-coloured. Leight. l. c. 59.

ENGLAND :—Poyning's Common, Sussex ! *Mr. Borrer*.

f. *marginata*, T. & B. *ardellæ* somewhat convex, parti-coloured, chiefly powdery on the margins. Leight. l. c. 59.

Exs :—Leight. 250. Bohl. 53. Nyl. 146. Zw. 11. B. Körb. 289. Anzi Venet. 87. Mudd 233.

ENGLAND :—Sussex ! *Mr. Borrer*. Ingleby Park ! near Ayton ! Yorkshire. *Mr. Mudd*. Kelvedon, Essex. *Mr. Varenne*. Abdon ! Shropshire.

IRELAND :—Dunscombe's Wood ! Cork. *Mr. Carroll*.

Var. *pruinata*, Del. *ardellæ* entirely albo-suffused. Nyl. Scand. 257.

f. *concolor*, T. & B. *ardellæ* convex, of the same colour with the thallus, albo-pruinose. Leight. l. c. 60.

Exs :—Leight. 251.

ENGLAND :—Sussex ! *Mr. Borrer*. New Forest, Hants. *Mr. Lyell*.

f. *dubia*, T. & B. *ardellæ* rather convex, lurid, dark-purple, pruinose.

ENGLAND :—Sussex ! *Mr. Borrer*. Kelvedon, Essex. *Mr. Varenne*.

f. *microstigma*, T. & B. *ardellæ* minute, solitary, depressed, albo-pruinose. Leight. l. c. 60.

ENGLAND :—Sussex ! *Mr. Borrer*.

IRELAND :—Glanmon ! Blarney ! Cork ; Ballynegarde co. Limerick, *Mr. Carroll*.

Var. *anerythrea*, Nyl. *ardellæ fuscous*, prominent, *naked, without any vermilion powder*.

ENGLAND :—Plymouth. *Mr. Holmes*. New Forest. *Rev. J. M. Crombie*.

f. *detrita*, T. & B. *ardellæ depressed, lurid, dark-purplish, naked, more or less stellate*. Leight. l. c. 60.

EXS :—Schaer. 649. Anzi Venet. 89. Arn. 363. Spruce Amaz. 347.

ENGLAND :—Sussex ! *Mr. Borrer*.

f. *astroidea*, Leight. *ardellæ rather large, in depressed, naked, radiate or stellate clusters, sub-immersed or very slightly raised, dark-reddish-black or full-brown-black*. Leight. l. c. 60.

EXS :—Mudd 234.

ENGLAND :—Ardingley, Michelgrove and Charlton Forest, Sussex ! *Mr. Borrer*. Airyholme ! Yorkshire. *Mr. Mudd*. Kelvedon, Essex. *Mr. Varenne*.

IRELAND :—Castlebernard ! O'Sullivan's Cascade ! Killarney. *Mr. Carroll*.

18. *A. pruinosa*, Ach. *whitish or pale-yellow, thin, tartareous, cracked and uneven, somewhat pulverulent, indeterminate ; ardellæ brownish or lead-coloured, rough, albo-pruinose, immersed, roundish or irregularly oblong or difformed, plane or slightly convex, internally pale ; spores 8, colourless, lineari-obovate, rounded at the extremities, generally 4-septate, (sometimes 5, sometimes 3-septate.)*

On old oaks, ivy, elm, yew and old timber, frequent 1831.

SYN :—Ach. L. U. 147. (1810.) Syn. 7. Nyl. Scand. 258. *A. impolita*, Leight. Br. Graph. p. 55.

FIG :—E. Bot. Suppl. 2692. f. 1. Leight. Br. Graph. t. 8. f. 35.

EXS :—M. & N. 1159. Schaer. 506. Leight. 131. Zw. 149. Nyl. 83, a. & b. Hepp 535. Anzi Etr. 51.

GEOG. DISTRIB :—Germany, Switzerland, France, Italy, Sweden, Normandy, N. America.

BOT. PROV :—1, 2, 3, 4, 5...7, 8...10, 11 ..19...24...31.

ENGLAND :—Kelvedon, Essex. *Mr. Varenne*. Plymouth. *Mr. Holmes*. Henfield, Sussex ! Kenilworth Castle ! Warwickshire ; Livermore ! Suffolk. *Mr. Borrer*. (1831.) Midland Counties. *Mr. Purton*. Cambridgeshire. *Rev. R. Relhan*. Ingleby ! *Mr. Mudd*. Oswestry ! Shropshire. *Rev. T. Salwey*. New Forest. *Rev. J. M.*

*Crombie*. Teesdale, Durlam. *Mr. Winch*. Twycross Church-yard, Leicestershire. *Rev. A. Blucam*. High Rock ! near Bridgnorth ; Uddington ! ; Batchcot ! ; Hey Forest ! near Ludlow ; Ludlow Castle ! Shropshire.

IRELAND :—Cledaneanure, Kerry. *Dr. Taylor*. Adare Abbey near Limerick. *Mr. Carroll*.

WALES :—Bettws-y-coed Church-yard !

CHANNEL ISLANDS :—St. Owen's, Jersey. *Mr. Lerbalestier*.

19. *A. Armoricana*, Nyl, very similar externally to *A. astroidea*, but *ardellæ* larger and more simple, sub-anastomosant, plane, apices sub-acute ; spores generally 4-septate.

On holly, very rare.

SYN :—Nyl. in Flora 1865. p. 355. *Crombie* En. 103.

GEOG. DISTRIB :—France.

BOT. PROV :—2..19.

ENGLAND :—New Forest, Hants. *Rev. J. M. Crombie*.

IRELAND :—Castlebernard co. Cork. *Mr. Carroll*.

\*\*\*\* *Spores 6-septate.*

20. *A. ilicina*, Tayl. cream-colour, thin, membranaceous, smooth, shining, scaly, limitate ; *ardellæ* brownish-black, plane, shining, sub-immersed, scattered, irregularly rounded or oblong, internally pale ; spores 8, colourless, very large, obovato-clavate, 6-septate, upper cell largest ; *gelatina hymenea* persistently blue with iodine.

On holly, frequent. 1836.

SYN :—Tayl. Fl. Hib. 2. 105. (1836.) Leight. Br. Graph. 56.

FIG :—Leight. l. c. t. 8. f. 36.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2..19.

ENGLAND :—New Forest, ! Hants. *Mr. Lyell*. St. Leonard's Forest, ! Sussex. *Mr. Borrer*.

IRELAND :—Glengarriff ! *Miss Hutchins*. Cromaglow, ! *Dr. Taylor*. (1836.) Killarney ; Old Dromore and Glencar, Kerry ; Glenbower Wood, Killeagh. *Mr. Carroll*.

21. *A. ilicinella*, Nyl. similar to *A. ilicina*, Tayl. but generally smaller and with smaller spores, 3-5-6-septate ; *gelatina hymenea* vinoso-rubescens with iodine.

On holly, rare. 1866.

SYN :—Nyl. in Flora 1867. p. 179. *Crombie* En. 102.

GEOG. DISTRIB :—Europe.

BOT. PROV :—19.

IRELAND :—Turk Mountain, ! Killarney. *Mr. Carroll*. (1866.)



\*\*\*\*\* *Spores murali-locular.*

22. *A. spectabilis*, Flot. *white*, thin, indeterminate, opaque, rimose and unequal; *ardellæ black or fuscous-black*, opaque, large, *anguloso-difformed or ramoso-incised*, often surrounded with a spurious thalline margin, internally concolorous; *spores* 8, colourless, oblong, *murali-locular*, (11 series) *large*.

On trees, rare.

SYN:—Flot in litt. ad Schaer. *A. difformis*, Nyl. Enum. 144. Crombie En. 103.

FIG:—Hepp Sporen t. 62. f. 536.

EXS:—Hepp 536. Anzi Langob. 236.

GEOG. DISTRIB:—Bavaria, Belgium, Hungary, Normandy, Germany, Italy, France, N. America.

BOT. PROV:—19.

IRELAND:—Crogham Mountain, Killarney. *Mr. Carroll*.

23. *A. anastomosans*, Ach. *greyish-white or cream-colour*, thin, smooth, contiguous; *ardellæ minute, crum-pent, simple or radiato-congregate*, scattered, brownish-black, plane; *spores* 8, colourless, oblong, *murali-locular*, (6 or 7 series) *small*.

On trees, rare. 1860.

SYN:—Ach. L. U. 146. (1810.) *Abrothelium dispersum*, Mudd Man. 252. Crombie En. 103.

FIG:—Mudd Man. t. 4. f. 99.

GEOG. DISTRIB:—Belgium, Pyrenees.

BOT. PROV:—19...31.

IRELAND:—Near Bantry. *Miss Hutchins*. Old Dromore! Glencar and near Killarney, Kerry. *Mr. Carroll*.

CHANNEL ISLANDS:—Jersey. *Mr. Larbalestier*.

\*\*\*\*\* *Parasitic species.*

24. *A. varians*, (Dav.) thallus none; *ardellæ parasitic, hymenicolar, rotundate, single or confluent, dull-black*, sessile, plane or more or less convex, roughish, internally pale-brown; *spores* 8, colourless, oblong, *normally 3-septate* (sometimes 2, sometimes 1-septate.)

Parasitic on the apothecia of *Lecanora glaucoma*, frequent. 1793.

SYN:—Dav. in Linn. Soc. Tr. 2. p. 284. (1793.) Nyl. Scand. 260. *Arthonia glaucomaria & parascenoides*, Nyl. Arth. p. 98. Leight. in Ann. & Mag. Nat. Hist. Oct. 1856.

FIG:—Linn. Trans. 2. t. 28. f. 3. Ann. & Mag. Nat. Hist. 1856. t. 11. f. 1. 2. 3. 4, 5.

EXS:—Leight. 247. Mudd 238. Larbal. 47. Arn. 210. 211.

GEOG. DISTRIB:—Sweden, Finland, Norway, France, Bavaria, Austria.

BOT. PROV:—5 . 7...10...15...23...30, 31.

ENGLAND:—Cliffriigg! Ayton Moor! Yorkshire. *Mr. Mudd.* Haughmond Hill! Caer Caradoc!; Long Mynd! Shropshire.

SCOTLAND:—Kincardine. *Rev. J. M. Crombie.*

IRELAND:—Barclay's Rock co. Down. *Adm. Jones.* Killiney! *Dr. Moore.* Lambay Island. *Mr. Carroll.*

WALES:—S. W. side of Anglesea. *Rev. Hugh Davies.* (1793.) Barmouth!

CHANNEL ISLANDS:—Petit Port!; La Moye; Noirmont! Jersey. *Mr. Larbalestier.*

25. *A. punctella*, Nyl. thallus none; *ardellæ* parasitic, innato-subsessile, punctiform, solitary, scattered; spores 6-8, colourless, obovato-clavate, 1-septate.

Parasitic on thallus of *Lecidea albo-atra*, (Hoffm.) rare. 1859.

SYN:—Nyl. MS. in Carroll's Contrib. to Irish Lichenol. p. 10. (1859.) Mudd Man. 252.

GEOG. DISTRIB:—Europe.

BOT. PROV:—20.

IRELAND:—Shore below Queenstown! *Mr. Carroll.* (1859).

### VIII. GLYPHIS, *Ach.*

Thallus often hypophylæodal or obsolete, bearing scattered, white, rotundato-irregular, plano-depressed, large verrucæ. Apothecia numerous, immersed in the verrucæ, black, elongato-flexuose and intricate, impressed or canaliculate. Spores colourless or fuscous, containing 4-10 transverse, ellipsoid-lenticular cells.

1. *G. labyrinthica*, Ach. fuscescenti-subolivaceous; verrucæ white, plano-convex, pulverulent, subreticulate with the sub-anastomosing black canaliculate rimæ of the elongated apothecia; spores 8, colourless, ultimately slightly fuscous, lineari-oblong, rounded at the extremities, 4-6-celled; paraphyses crowded, indistinct; gelatina hymenea untinged with iodine.

On trees, very rare.

SYN:—Ach. Syn. 107. (1817).

FIG:—Linn. Trans. 12. t. 2. f. 1. Fée Ess. Crypt. t. 16. f. 3. Fée Mem. Lich. t. 1. f. 2. Linn. Trans. 27. t. 36. f. 68.

EXS:—Spruce Lich. Amaz. 405.

GEOG. DISTRIB:—Guyana, Amazons, Ceylon.

BOT. PROV:—13.

IRELAND :—Killarney. *Sir Thos. Gage*. in *Herb. Brit. Mus.*  
*teste Rev. J. M. Crombie*.

## IX. CHIODECTON, *Ach*.

Thallus thin, whitish, with scattered elevated sub-rotund white pulverulent verrucæ. Apothecia pale-brown, pruinose, substellato-radiate, plane, aggregated or confluent and immersed in the verrucæ. Hymenium ceraceo-gelatinose, pale, supported on the vertical divisions of an opaque blackish-brown hypothecium. Paraphyses distinct. Spores 8, fusiform, 3-septate. Spermatia acicular, arcuate.

1. *C. albidum*, (Tayl.) *whitish, sub-squamoso-areolate, dispersed, pulverulent; thallodal verrucæ, scattered, elevated, sub-rotund, depressed; apothecia pale-brown, naked or pruinose, sub-stellato-radiate; spores 8, colourless, broadly linear-fusiform, 3-septate.*

On shaded rocks, very rare.

SYN :—*Synccesia albida*, Tayl. *Fl. Hib.* 2. 163. (1836.) *Chiodecton*, Leight. *Ang. Lich.* 25.

FIG :—Leight. l. c. t. 8. f. 4. t. 9. f. 1.

GEOG. DISTRIB :—Europe.

BOT. PROV :—19...30.

IRELAND :—Between Dunkerron and Killarney; Kerry! *Dr. Taylor*. (1836.) co. Antrim. *Dr. Moore*.

Var. *Sarniense*, Salw. *white or cream-coloured, thick, tartareous, colliculoso-verrucose; apothecia albo-pruinose,*

On maritime rocks, rare. 1847.

SYN :—*Chiodecton Sarnienis*, Salw. in litt. 1859. Mudd Man. 245. *Chiodecton petræum*, Del.

GEOG. DISTRIB :—Europe.

BOT. PROV :—31.

CHANNEL ISLANDS :—Jerbourg! Guernsey. *Rev. T. Salwey*. (1847.) La Coupe and Boulay Bay! Jersey. *Mr. Larbalestier*. Sark. *Mrs. Collings*.

## X. MELASPILEA, *Nyl*.

Thallus very thin or obsolete. Apothecia arthonoid, black, superficial. Paraphyses distinct. Spores 8, generally colourless, 1-septate. Spermatia straight. Gelatina hymerea only yellow with iodine.

1. *M. amota*, Nyl. *whitish, macular, indeterminate;*

*apothecia black, innate, rotundate or rotundato-difformed, proper margin thin, unequal; hypothecium slightly darkened; spores 4-8, colourless, rotundo-oblong, 1-septate, constricted.*

On old trees, rare. 1866.

SYN :—Nyl. in Flora 1867. p. 178. Crombie En. 105.

GEOG. DISTRIB :—Europe.

BOT. PROV :—19.

IRELAND :—Turk Mountain ! Killarney ! *Mr. Carroll.*

2. *M. ochrothalamia*, Nyl. very thin, *dirty-virescent*, indeterminate ; *apothecia black or fuscous*, opaque, patellulate, minute, adnate, plane, obsoletely margined, internally luteoochraceous ; spores 8, *fusco-nigrescent*, lineari-oblong, 1-septate, constricted.

On willow, rare. 1869.

SYN :—Nyl. in Flora 1865. p. 355. Crombie En. 106.

GEOG. DISTRIB :—France.

BOT. PROV :—19.

IRELAND :—Enniskeam ! co. Cork ; Mangerton, Killarney ; Glenbower Wood, Killeagh co. Cork. *Mr. Carroll.* (1869).

## TRIBE XVII. PERIDIÆI.

Hymenia covered by a black rimuloso-dehiscent peridium.

### I. MYCOPORUM, *Flot.*

Thallus thin or obsolete. Apothecia fuscous-black or black, rotundato-difformed or linear, containing many hymenia conjoined as in a common excipulum, but without perithecium. Paraphyses indistinct. Spores 8, oblong, variously septate, septa irregular.

1. *M. sparsellum*, Nyl. *white*, very thin, determinate, or indicated by a dilated darkly-limitate white or whitish spot ; *apothecia black, rotundate, prominent, rugose*, somewhat irregular, internally pale and colourless ; hypothecium colourless ; paraphyses indistinct ; spores 8, colourless, ovoid, 1-septate ; gelatina hymenea untinged with iodine.

On holly, very rare.

SYN :—Nyl. N. Gran. Addit. 575. (1857.) Crombie En. 106.

ENS :—Lindig 62.

GEOG. DISTRIB :—N. Granada.

BOT. PROV :—19.

IRELAND :—Cromaglow, Killarney. *Mr. Carroll.*

2. *M. miserrimum*, Nyl. thallus indicated by a *pale* spot or obsolete ; *apothecia minute, difform, black, macular, 2-6-nodulose* (nodules convex, resembling the conceptacula of a *Verrucaria*, but without any impressed epithecium) internally and basally whitish, *depressed between the nodules* ; asci sphaeroid or oblongo-sphaeroid ; spores 8, colourless, *oblong, 3-5-septate, (often variously and longitudinally sparingly divided)* ; paraphyses none ; thalamium colourless, laxly indistinctly cellulose ; conceptaculum nigricant, conspicuously fusco-cellulose ; gelatina hymenea untinged with iodine, but the protoplasm of the asci vinous-red.

On trees in sub-alpine regions, very rare.

SYN :—Nyl. Enum. 145. (1858.) Crombie En. 106.

GEOG. DISTRIB :—France.

BOT. PROV :—19.

IRELAND :—Glengariff. *Adm. Jones.*

## II. RIMULARIA, *Nyl.*

Thallus thin, crustaceous. Apothecia black, rotundate, depressed in the centre, dehiscing by a sub-radiate fissure. Paraphyses slender, often branched. Spores 8, colourless or fuscous, ellipsoid, simple.

1. *R. limborina*, Nyl. cinereous, thin, rimulose or sub-arcolate ; apothecia black or fuscous-black, opaque, rugulose, depressed, somewhat convex, rotundate or oblongo-rotundate, depressed in the centre and fissured by a thin sub-radiate chink, internally cinerascens ; spores 8, colourless, at length fuscous or fuscous, ellipsoid, simple ; paraphyses slender, irregular and generally branched ; perithecium (peridium) black in upper part, below (hypothecium) fusco-nigricant ; gelatina hymenea slightly blue with iodine and then fulvous-red.

On calcareous mountain rocks, rare. 1865.

SYN :—Nyl. in Flora 1868. p. 346. Crombie in Seem. Journ. Bot. 7. 50.

GEOG. DISTRIB :—France.

BOT. PROV :—15.

SCOTLAND :—Craig Guie, Braemar. *Rev. J. M. Crombie.*



## SERIES VI. PYRENODEI.

Fructification in closed receptacles.

## TRIBE XVIII. PYRENOCARPEI.

Thallus various, peltate, squamulose, areolate, continuous, hypopblæodal, or evanescent. Apothecia pyrenodine, hymenium enclosed in an entire or dimidiate black perithecium with an apical poriform epithecium.

I. THELOCARPON, *Nyl.*

Thallus thin, crustaceous. Apothecia granuloso-verrucæform, ostiole punctiform. Nucleus gelatinous, colourless. Perithecium sub-ceraceous. Paraphyses slender, flexuose. Asci ventricoso-fusiform. Spores innumerable, minute, ellipsoid, colourless, with an indistinct nucleus at each extremity.

1. *T. Laureri*, (Flot.) brownish-grey, crustaceous, somewhat furfuraceous, thin or evanescent; apothecia scattered, minute, granuloso-verrucose, of a citrine yellow-colour, ostiolum slightly depressed, inconspicuous; spores numerous, minute, colourless, ellipsoid, obsoletely polari-nucleolate.

On larch rails, rare. 1864.

SYN:—Nyl. Lich. Alger. p. 338. (1854.) Leight. in Ann. and Mag. N. Hist. Dec. 1864.

FIG:—Ann and Mag. Nat. Hist. 1864. t. 9. f. 1. 2. 3. 4. 5.

EXS:—Leight. 351.

GEOG. DISTRIB:—Europe.

BOT. PROV:—5.

ENGLAND:—Middletown, ! Shropshire. (1864); Cemetery near Shrewsbury !; Stableford ! near Bridgnorth, Shropshire.

2. *T. epithallinum*, Leight. parasitic on the thallus of *Baeomyces rufus*; apothecia scattered, minute, granuloso-verrucose, flavo-virescent; spores numerous, minute, colourless, oblong or cylindraceo-oblong.

Parasitic on *Baeomyces rufus*, very rare. 1864.

SYN:—Leight. in Ann. and Mag. Nat. Hist. July. 1866. Nyl. in Flora Oct. 1866. p. 420.

GEOG. DISTRIB:—Europe.

BOT. PROV:—5.

ENGLAND:—Stiperstones Hall ! Shropshire. (1864)

II. NORMANDINA, *Nyl.*

Thallus squamose or squamulose, squamulæ thin, rotundate. Apothecia black, immersed.

1. *N. latevirens*, Turn. & Borr. *late-virescent*, squamulose, membranaceous, *squamules orbicular*, sinuate and rotundato-lobate, imbricated, adnate, regularly and deeply concave, margins upturned and thickened or inflexed, *naked and whitish beneath*; apothecia unknown.

On moist earth, frequent. 1810.

SYN:—*Verrucaria*, Turn. & Borr. E. Bot. Suppl. 2658. *Endocarpon viride*, Ach. L. U. 300. Syn. 100. *Endocarpon latevirens*, Leight. Ang. Lich. 12. *Normandina*, Nyl. Scand. 264.

FIG:—E. Bot. Suppl. 2658.

EXS:—Leight. 25. Mudd 258.

GEOG. DISTRIB:—Europe, Lapland, N. America.

BOT. PROV:—1, 2, 3...5...7...10...12...15...19...30, 31.

ENGLAND:—Esher, Surrey. *Mr. Turner*. Black Down, Sussex; Tonbridge Wells. *Mr. Borrer*. Mynydd-y-Myfyr! Oswestry, Shropshire. *Rev. T. Salwey*. Cumberland! *Mrs. Stanger*. Battersby Bank and Ingleby Moor! Cleveland. *Mr. Mudd*. Devonshire! *Hook. Herb.* Stiperstones Hill! Caradoc! Shropshire.

SCOTLAND:—Ben Lawers. *Dr. Maingay*.

IRELAND:—Doneraile Mountains; Mangerton, Kerry. *Mr. Carroll*. near Belfast. *Mr. Templeton*. near Bantry. *Miss Hutchins*. Carig Mountain and Dunkerron. *Dr. Taylor*.

WALES:—Aran Mowddly! Merionethshire. *Mr. Borrer*. Sychant! near Conway; Cell Fawr! Barmouth.

CHANNEL ISLANDS:—Quenvais, Jersey. *Mr. Larbalestier*.

2. *N. pulchella*, Borr. *glaucous or greenish-grey*, membranous, squamulose, *squamules orbicular*, concave, rotundate or rotundato-lobate, adnate, *concentrically wrinkled*, margin upturned, thickened or inflexed, *frequently soresiate, pale-brown and tomentose beneath*; apothecia immersed in thalline tubercles, perithecium entire, black; spores 8, colourless, lineari-cylindrical, 7-septate.

On mossy trees, not common.

SYN:—*Verrucaria*, Borr. in E. Bot. Suppl. 2602. (1829.) *Endocarpon*, Leight. Ang. Lich. 13. *Normandina*, Nyl. Prodr. 173.

FIG:—E. Bot. Suppl. 2602. f. 1. Leight. Ang. Lich. t. 3. f. 1.

EXS:—Leight. 367. Zw. 245. Larbal. 93. Nyl. 89. Mass. 339.

GEOG. DISTRIB:—France, Germany, Austria, Italy, N. Zealand, Mexico, Asia.

BOT. PROV:—1, 2...7...15...19...30, 31.

ENGLAND:—Sussex! *Mr. Borrer*. Appuldercombe, Isle of Wight; Beeding Priory! Sussex. *Rev. A. Bloem*. Launceston, Cornwall. *Rev. J. M. Crombie*. Tilgate Forest, Sussex. *Mr. Lorbalestier*. Plymouth. *Mr. Holmes*.

SCOTLAND:—Killin and Lochaber. *Rev. J. M. Crombie*.

IRELAND:—Ballymartle! co. Cork. *Mr. Carroll*. near Bantry. *Miss Hutchins*. Tollymore Park, co. Down. *Dr. Maingay*. Kerry. *Adm. Jones*.

WALES:—Barmouth! *Rev. T. Salwey*. Rhewgreidden. *Rev. A. Bloom*. Llyn Aran! Cader Idris.

CHANNEL ISLANDS.—Guernsey; St. Peter's Valley, Rozel! La Moye! Jersey. *Mr. Lorbalestier*.

### III. ENDOCARPON, *Hedw. Nyl.*

Thallus peltate or squamæform or areolate. Apothecia with a pale rarely infusate perithecium. Paraphyses none. Spores 8, colourless, oblongo-ellipsoid, simple.

1. *E. miniatum*, (L.) cinereous or cinereous-white, simple, firm, coriaceous, peltate, umbilicato-affixed, large, expanded, rotundato-or undulato-crenato-lobate, smooth or minutely albo-granuloso-pruinose, under surface smooth or rugulose, fulvous; apothecia minute, very numerous, imbedded; epithecium slightly elevated, brown; spores 8, colourless, oblong or ellipsoid, simple.

On sub-alpine rocks, frequent. 1741.

SYN:—*Lichen*, Linn. Sp. Pl. 50. (1762.) *Endocarpion*, Ach. Syn. 101. Leight. Ang. Lich. a. 11. Nyl. Scand. 265.

FIG:—*E. Bot.* 593. (2 upper fig.) Leight. Ang. Lich. t. 1. f. 4.

EXS:—Leight. 26. Anzi It. S. 356. Hepp 218. a. 666. Lorbalestier 94. Mass. 6. Mudd 255. Schar. 112. M. & N. 57. Bohl. 1. Welw. Lusit. 24.

GEOG. DISTRIB:—France, Pyrenees, Portugal, Sweden, Hungary, Italy, Germany, Austria, Algeria, N. America.

BOT. PROV:—1...5, 6, 7, 8...10, 11...17, 18. (19—30)...31.

ENGLAND:—Cheddar rocks, co. Somerset. *Dillenius*. (1741)! Saxton's bath. Matlock. *Sir J. E. Smith*. Tor near Wells, co. Somerset. *Mr. Littleton Brown*. St. Vincent's Rocks! *Mr. Borrer*. Craig-y-Rhiw! near Oswestry, Shropshire. *Rev. T. Salwey*. Rokeby! Durham. *Mr. Mudd*. Hils Wood, Ingleborough. *Dr. Carrington*. near Settle. *Dr. Windsor*. Gummer's Pool in Castle Eden Dene; Stanhope in Weardale; Middleton-in-Teesdale; Egglestone, Durham. *Mr. Wench*. Bradley Woods; Newton, Devon. *Mr. Pasfill*. Chudleigh, Devon. *Mr. Holmes*. Salisbury. *Dr. Fluggie*. Tintagel Castle. *Hook. Herb.*

SCOTLAND:—Craig Guie, Braemar; Dunottar Castle, Kincardineshire. *Rev. J. M. Crombie*. Ross-shire. *Mr. Creall*. Forfarshire. *Hook. Herb.*

IRELAND :—On dry limestone rocks, frequent. *Mr. Carroll.*

WALES :—Barmouth. *Rev. T. Salwey.* Hisvae ; Llanfaethly, Anglesea. *Messrs. Brewer & Green.* Langer ! S. Wales. *Rev. J. P. Crouch.* Tenby, Pembrokeshire. *Miss Atwood.* Puffin Island, Anglesea. *Rev. A. Bloxam.* Diganwy ! near Conway.

CHANNEL ISLANDS :—L'Etacq ; La Moie ; Beauport ; Rozel Tower, Jersey ! Jerbourg, Guernsey. *Mr. Larbalestier.*

*Var. complicatum*, (Sw.) *densely caespitose, polyphyllous, lobes ascending, imbricate and complicate, sub-pruinose, greyish, margins rotundate, erect, blackish.*

On moist and wet rocks, frequent. 1741.

SYN :—Swartz Nova Act. Upsal. 4. p. 38. (1744.) Ach. Syn. 102. Nyl. Scand. 265. Leight. Ang. Lich. 11.

FIG :—E. Bot. 593. lower fig. Leight. Ang. Lich. t. 2. f. 1.

EXS :—Leight. 167. Mudd 256. Hepp 667. Anzi It. S. 357. Breutel 303. Schær. 113. Mass. 164.

GEOG. DISTRIB :—France, Switzerland, Pyrenees, Italy, Germany, Hungary.

BOT. PROV :—5, 6, 7...10, 11...(19—30).

ENGLAND :—Yorkshire. *Mr. Salt.* St. Vincent's Rocks. *Mr. Borrer.* Shropshire ! *Rev. T. Salwey.* Falcon Clints ! Teesdale. *Mrs. Stanger.*

SCOTLAND :—Craig Guie, Glen Lochay. *Rev. J. M. Crombie.*

IRELAND :—On rocks in streams, frequent. *Mr. Carroll.*

WALES :—Near Perfeddgoed House, Bangor. *Mr. Brewer.* (1741). Funnon Comb y Goff, Radnorshire. *Mr. Littleton Brown.*

*Var. leptophyllum*, Ach. *dark-brown, small, peltate, rounded, lobed and wavy, smooth, nigro-fuscous beneath.*

On alpine rocks, rare.

SYN :—Ach. Prodr. 141. (1798.) Nyl. Scand. 265. Leight. Ang. Lich. 12.

FIG :—E. Bot. 2012. f. 2. Leight. Ang. Lich. t. 2. f. 2.

GEOG. DISTRIB :—Europe.

BOT. PROV :—7.. 12...16 ..19...29, 30.

ENGLAND :—Rocks by Bassenthwaite Water, Cumberland. *Mr. Robertson.*

SCOTLAND :—Shore of Loch Lomond near Tarbet ! *Mr. Borrer.*

IRELAND :—Near Bantry. *Miss Hutchins.* frequent in the northern Counties. *Dr. Moore.*

WALES :—Llyn Bodlyn ! Glasllyn ! Snowdon. *Mr. Borrer.* Llyn Gwernon, Llyn Howel and Llyn Bodlyn. *Rev. T. Salwey.*

2. *E. fluviatile*, (D.C.) *lurido-fuscescent, polyphyllous, caespitose, lobes tumid and bullate, crenate or inciso-crenate, strongly recurved, smooth or albo-granuloso-pruinose above, nigro-fuscous beneath.*

On rocks in sub-alpine streams and lakes, rare. 1799.

SYN:—D. C. Fl. Fr. 2. 413. (1805.) Nyl. Scand. 265. Mudd Man. 266.

FIG:—E. Bot. 594.

EXS:—Anzi Langob. 217. Larbal. 95. Fellm. 211. M. & N. 152. Schær. 114.

GEOG. DISTRIB:—Sweden, E. Lapland, Pyrenees, Italy, Germany, Hungary, N. America.

BOT. PROV:—1...6, 7...11...15, 16 ..22...29...31.

ENGLAND:—River Tees near Eglestone, Durham. *Rev. J. Harri-man*. River Teign, Devon. *Mr. Parfitt*. Erne, Devon. *Rev. J. M. Crombie*. Dartmoor. *Mr. Holmes*.

SCOTLAND:—Ben Lawers! *Herb. Hooker*. Mountain Streams! *Mr. Borrer*. Appin; Craig forth near Stirling; Loch Lomond; Loch Linnhe. *Rev. J. M. Crombie*.

IRELAND:—Knockcurris, Innishowen. *Mr. Brown*. Luggela, Wicklow. *Adm. Jones*. Dargle. *Dr. Stokes*.

WALES:—Hafod, Cardiganshire. *Sir J. E. Smith*. (1799.) Llyn Gwernan! Cader Idris.

CHANNEL ISLANDS:—Boulay Bay; East Coast of Jersey! Saints Bay, Guernsey. *Mr. Larbalestier*.

Var. *euplocum*, Ach. greyish-brown, minute, monophyllous, umbilicate, deeply laciniato-lobate, margins crisped and recurved.

On maritime rocks, rare.

SYN:—Ach. L. U. 301. (1810.) Nyl. Scand. 265. Leight. Ang. Lich. 12.

FIG:—E. Bot. Suppl. 2602. f. 2. Leight. Ang. Lich. t. 2. f. 3.

GEOG. DISTRIB:—Sweden.

BOT. PROV:—11.

ENGLAND:—On the shore of the Tyne! near Newcastle. *Mr. Robertson*.

3. *E. rufescens*, Ach. *rufescent*, squamose, squamulæ rotundate, incised, undulato-flexuose, adnate, sub-imbricate and complicate, margins thickened, repando-lobulate; spores 8, colourless, oblong, simple.

On the earth among mountain rocks, rare.

SYN:—Ach. L. U. 304. (1810.) Nyl. Scand. 265.

FIG:—Hepp Sporen t. 24. f. 219.

EXS:—Zw. 22. Anzi Langob. 219. Schær. 465. Mass. 188. Hepp 219. Bohl. 75.

GEOG. DISTRIB:—Germany, France, Switzerland, Italy, Norway, Austria, Hungary, New Zealand, Africa.

BOT. PROV:—1, 2...5.. 7, 8 ..14, 15...19...30.

ENGLAND:—Horsham Church! Sussex. *Mr. Borrer*. Charnwood Forest, Leicestershire; Clifton near Bristol. *Rev. A. Bloxam*. Plymouth. *Mr. Holmes*. Torquay. *Hook. Herb.* Llanymynech Hill! Shropshire.

SCOTLAND:—Ben Lawers! Arthur's Seat; Hill of Kinnoul. *Hook.*



*Herb. Ben Ledi* ; *Craig Tulloch* ; *Craig Guie. Rev. J. M. Crombie.*

IRELAND :—*Carig Mountain, Kerry. Dr. Taylor. Cave Hill, Belfast. Dr. Moore.*

WALES :—*Arthur's Table, Anglesea. Rev. A. Bloxam.*

*f. lachneum, Ach. fusco-virescent, squamose, squamulae rotundate, sub-incumbent, flexuose, slightly tumid, margin sub-crenate, free.*

On earth in mountain regions, rare.

SYN ;—*Ach. L. U. 299. (1810.) Leight. Ang. Lich. p. 14.*

FIG :—*E. Bot. 1698. & 2012. f. 1. Leight. l. c. t. 3. f. 2.*

EXS :—*Fries 355. M. & N. 442. Mass. 189. Mudd 257, Anzi Langob. 218. Arn. 169.*

GEOG. DISTRIB :—*Sweden, Russia, France, Switzerland, Italy, Swan River.*

BOT. PROV :—*5, 6, 7.. 15.*

ENGLAND :—*Blodwell Rocks! Shropshire. Rev. T. Salwey. Cheddar ; St. Vincent's rocks! Mr. Borrer.*

SCOTLAND :—*Hill of Kinnoul near Perth. Messrs. Hooker & Borrer.*

WALES :—*Tenby Castle! Pembrokeshire. Mr. Mudd. Llandudno! Carnarvonshire.*

4. *E. hepaticum, Ach. rufo-fuscescent or fuscous, squamose, squamulae round or angular, simple, more or less dispersed, adnate, plane, margin entire, elevated and nigricant ; spores 8, colourless, oblong, simple.*

On earth and on walls, rare. 1794.

SYN :—*Ach. L. U. 298. (1810.) Nyl. Scand. 265. E. Hedwigii, Leight. Ang. Lich. 14.*

FIG :—*E. Bot. 595. Leight. l. c. t. 3. f. 3.*

EXS :—*Nyl. 87. Schaer. 115. Hepp 220. M. & N. 441. Leight. 135.*

GEOG. DISTRIB :—*France, Italy, Switzerland, Germany, Africa, N. America.*

BOT. PROV :—*1, 2...4, 5.. 7...11...15, 16...19.*

ENGLAND :—*Near Croydon. Mr. Dickson. (1794.) Norfolk. Mr. Turner. Sussex Downs! Mr. Borrer. Newmarket Heath! Rev. T. Salwey. Chance's Pitch! Malvern Hills. Mr. Lees. Penzance. Rev. J. M. Crombie. Eglestone, Durham. Rev. J. Harriman. Plymouth. Mr. Holmes. Blackstone Rock, Devon. Dr. Dickie. Wall of Moor Park near Ludlow!*

SCOTLAND :—*Ben Nevis. Herb. Hook. Killin and Appin. Rev. J. M. Crombie.*

IRELAND :—*Dunkerron, Kerry. Dr. Taylor. Lota, Cork. Mr. Carroll.*

WALES :—*Dolgelley. Dr. Holl. between Barmouth and Borthwen, and Cader Idris. Mr. Ralfs.*

*f. exiguum, Nyl. pale or pale-yellowish, squamose,*

squamule small, closely adnat, very thin, perpendicular, scattered.

On earth, rare.

SYN:—Nyl. Prodr. 176.

EXS:—Nyl. 88. Mass. 161. Zw. 403.

GEOG. DISTRIB:—France, Germany, Switzerland, Italy.

BOT. PROV:—10...31.

ENGLAND:—Sutton Bank! near Thirsk, Yorkshire. *Mr. Baker*.

CHANNEL ISLANDS:—Beauport Bay! Jersey. *Mr. Larcheslar*.

#### IV. VERRUCARIA, *Pers. Nyl.*

Thallus mucoso-gelatinous, or continuous and smooth, or rimuloso-areolate, or areolato-diffract, or pulverulent, or squamulose, or evanescent. Apothecia pyrenodine, perithecium black, rarely pale or coloured, entire or dimidiate, semi-immersed or sessile. Spores 2, 4, 8, or numerous, simple or variously septate, or locular, colourless or fuscous.

##### A. *Spores simple.*

##### \* *Thallus mucoso-gelatinous.*

1. *V. mucosa*, Whlhb. *olivaceo-or nigro-virescent, mucoso-gelatinous, smooth, continuous, thickish, diffuse or frequently in orbicular zonate patches; apothecia black, very minute, punctiform, innate and immersed, scarcely prominent above the thallus; ostiolum appearing only as a thin, circular black ring surrounding the large depressed, umbilicate perithecium; perithecium dimidiate; paraphyses none; spores 8, colourless, minute, linear-ellipsoid, simple, frequently polari-nucleolate; gelatina hymenea yellowish-red with iodine.*

On maritime rocks, not frequent.

SYN:—Whlhb. in Ach. Meth. Suppl. 23. (1803.) Nyl. Scand. 275.

EXS:—Th. M. Fries 75.

GEOG. DISTRIB:—Sweden, Lapland, Norway.

BOT. PROV:—13, 14...16...19—23...30, 31.

SCOTLAND:—Ardrossan! *Dr. Landsborough*. (1851); Newhaven! near Leith. *Dr. Greville*. Ardrishaig! Argyshire. *Dr. Lindsay*.

IRELAND:—Woburn co. Down! *Adm. Jones*. Howth. *Dr. Moore*. Cork coast. *Mr. Carroll*.

CHANNEL ISLANDS:—South coast of Jersey! *Mr. Larcheslar*.

2. *V. halophila*, Nyl. *olivaceo-virescent or nigricanti-virescent, mucoso-gelatinous, thin, continuous, smooth.*

effuse or macular ; *apothecia black and shining*, numerous, crowded, moderate, *hemispherico-globose*, somewhat truncate, *sessile*, immersed only at the base ; *epithecium regularly poriform*, or more or less dilated and depressed ; perithecium dimidiate ; paraphyses none ; spores 8, colourless, very minute, ellipsoid, simple, generally with 2 nuclei ; gelatina hymenea red with iodine.

On maritime rocks, frequent. 1851.

*V. leptotera*, Nyl. in Flora 1865. p. 212. according to specimens from Mr. Larbalestier is only a state of *V. halophila*.

SYN :—Nyl. Chil. 175. (1859.) Prodr. 185. *V. aquatilis*, Mudd. *V. Whichcotii*, Larbal.

EXS :—Larbal. 100. 50. Mudd 270. 271. Leight. 33. in part.

GEOG. DISTRIB :—France, Normandy, Chili.

BOT. PROV :—7.. 10...14...30, 31.

ENGLAND :—Near Ayton, ! Cleveland ; Black Rocks ! near Hartlepool. *Mr. Mudd*.

SCOTLAND :—Newhaven ! near Leith, Edinburgh. *Dr. Greville*. (1851).

IRELAND :—Woburn co. Down. *Adm. Jones*.

WALES :—Black Stones ! Conway Bay.

CHANNEL ISLANDS :—St. Aubin's Bay ; Grevè-au-Langon ! Jersey ! Guernsey. *Mr. Larbalestier*.

3. *V. striatula*, Whlnb. *black or nigro-virescent*, mucoso-gelatinous, thin, effuse, *effigurato-dendritic*, consisting of small elevated difformed, distinct, convex, branched, dendritico-radiant lines ; *apothecia black and polished*, minute, *sessile*, *sub-globose*, *truncate* ; *epithecium large, depressed, umbilicate* ; perithecium dimidiate ; paraphyses none ; spores 8, colourless, very minute, ellipsoid or oblong, simple ; gelatina hymenea vinous-red with iodine.

On maritime rocks, rare. 1865.

SYN :—Whlnb ! in Ach. Meth. Suppl. 21. (1803.) Nyl. Scand. 274.

GEOG. DISTRIB :—Norway, Lapland.

BOT. PROV :—31.

CHANNEL ISLANDS :—Caves at Grève-au-Langon ! ; Plémont ! ; Noirmont ! Jersey. *Mr. Larbalestier*. (1865).

4. *V. microsporoides*, Nyl. similar to *V. mucosa*, but with larger spores ; perithecium nearly entire or dimidiate.

On wave-washed maritime rocks, rare. 1865.

SYN :—Nyl. Lich. Armor. in Bull. Soc. Bot. Franc, 8. p. 759. 1861.) Carroll in Seem. Journ. Bot. 3. 293.

GEOG. DISTRIB:—France.

BOT. PROV:—24...30.

IRELAND:—Glenarm and Garron Point, co. Antrim. *Adm. Jones*. (1865.) Kilkee, co. Clare. *Mr. Carroll*.

5. *V. epigæa*, (Pers.) *pale-brown, grey or yellowish-green, mucoso-gelatinous when moist, subleprose when dry, thin, sub-effuse; apothecia black, immersed, globose or subampullæform, minute; ostiolum nearly flat, slightly dilated; epithecium poriform; perithecium entire, upper portion thicker; spores 8, colourless, irregularly obovate or oblong or oblongo-ellipsoid, simple.*

On the earth, frequent. 1806.

SYN:—*Sphaeria*, Pers. Syn. Fung. App. 27. (1801.) *Verrucaria*, Ach. Meth. 123. L. U. 295. Syn. 96. Nyl. Scand. 276. Leight. Ang. Lich. 64.

FIG:—E. Bot. t. 1681. Leight. Ang. Lich. t. 27. f. 4.

EXS:—Fries 246. (fide Nyl.) Schær. 106. Anzi It. S. 379.

GEOG. DISTRIB:—Sweden, Switzerland, Scandinavia, Lapland, Italy, France.

BOT. PROV:—2...4, 5...7, 8...11...19...23, 24...30.

ENGLAND:—Norwich. *Rev. G. R. Leathes*. (1806.) Sussex! *Mr. Borrer*. Hay Coppice! Herefordshire. *Rev. T. Salwey*. Twycross! Leicestershire. *Rev. A. Bloxam*. Teesdale, Durham. *Rev. J. Harri-man*. Northumberland and Durham. *Mr. Winch*.

IRELAND:—Belfast. *Mr. Templeton*. Killiney near Dublin. *Dr. Taylor*. near Bantry. *Miss Hutchins*. Ross, co. Clare. *Mr. Carroll*.

WALES:—Dolgelley. *Dr. Holl*.

\*\* *Thallus continuous, smooth.*

6. *V. Dufourei*. D.C. *grey or smoky-brownish-grey, thin, tartareous, continuous, smooth, determinate; apothecia black, and more or less polished, numerous, scattered or confluent, hemispherical, prominent, truncate; epithecium large, depressed, open or umbilicate; perithecium dimidiate, much incurved, inner tunic very thin, black; paraphyses none; spores 8, colourless, oblong, simple; gelatina hymenea red with iodine.*

On calcareous rocks, frequent. 1830.

SYN:—DC. Fl. Fr. 2. 318. (1805.) Leight. Ang. Lich. 76. *V. concinna*, Borr. E. B. Suppl. 2623. Leight. Ang. Lich. 50.

FIG:—E. Bot. Suppl. t. 2623. f. 1. Leight. Ang. Lich. t. 22. f. 3.

EXS:—M. & N. 953. Schær. 101. Anzi It. S. 378. Anzi Venet. 152. Krbr. 294. Mass. 212.

GEOG. DISTRIB:—France, Switzerland, Pyrenees, Italy, Hungary.

BOT. PROV:—2...7...10, 11, 12...19...30.

ENGLAND:—Durham. *Mr. Robertson*. (1830.) near Eglestone!

Durham ; Sussex Downs ! *Mr. Borrer*. Maze Beck ! Westmoreland ! *Mr. Robertson*. Cullercoats, Cumberland. *Mr. Lisle*. Helks Wood, Ingleborough. *Dr. Carrington*. Hartlepool, Durham. *Mr. Madd.*

IRELAND :—Kerry. *Dr. Taylor*. Glenarm and White Park co. Antrim. *Dr. Moore*. Kenmare, Kerry ; Middleton near Cork. *Mr. Carroll*.

WALES :—Eglswg rocks ! near Llangollen.

7. *V. margacea*, Whlmb. *olive-brown or cinereo-fuscescent*, crustaceous, sub-membranaceous, thin, *smooth*, somewhat shining, *continuous or sub-rimulose*, effuse or determinate ; *apothecia concolorous, covered by, and immersed in thalline elevations*, the minute black apices or *ostiola only visible* ; epithecium poriform ; *perithecium black, dimidiate* ; paraphyses none ; spores 8, colourless, ellipsoid or oblong, simple, large ; gelatina hymenea vinous-red with iodine.

On wet rocks, frequent. 1833.

SYN :—*Thelotrema*, Whlmb. in Ach. Meth. Suppl. 30. (1803.) *Verrucaria*, Whlmb. Lapp. 465. Nyl. Scand. 272.

FIG :—E. Bot. Suppl. t. 2768. Hepp Sporen t. 12. f. 95.

EXS :—Schær. 521. Arn. 421. Anzi It. S. 368. Hepp 95.

GEOG. DISTRIB :—Sweden, Switzerland, Bavaria, Germany, Italy.

BOT. PROV :—1, 2, 3...11...14...19 . 24.. 30, 31.

ENGLAND :—Hind Head ; near Abinger, Surrey ; above Rundhurst at foot of Black Down ; in Harting Coomb ; and Edburton. Sussex. *Mr. Borrer*. (1833.) North of England. *Mr. Woods*. near Dartmouth, Devon. *Mr. Parfitt*.

SCOTLAND :—Habishow near Edinburgh. *Dr. Maingay*. Morrone : Glen Tilt. *Rev. J. M. Crombie*.

IRELAND :—Bantry. *Miss Hutchins*. Barclay's Rock co. Down. *Adm. Jones*. Kilkee, Clare ; Ballinhassig, Cork ; and on Caher, Mc Gillicuddy's Reeks ; Blackwater Bridge, Kerry. *Mr. Carroll*. Ardglass co. Down. *Dr. Maingay*.

CHANNEL ISLANDS :—Noirmont and St. Ouen's, Jersey ; Jernbourg, Guernsey. *Mr. Larbalestier*.

Var. *æthiobola*, Whlmb. similar to the type, but the *ostiola* of the apothecia are *more denuded*, black ; the *apothecia prominent, and only immersed at the base* ; epithecium larger, depressed, umbilicate ; spores much smaller.

On wet rocks, frequent.

It is often difficult to separate this variety from the type, and its differences seem to consist principally, so far as external character, in the *ostiola* of the prominent apothecia being more denuded. *V. hydraea* seems identical. There are two states, one in which the



thallus is pale-brown like the type, the other in which it is fuscous or rufo-fuscescent.

SYN :—Whlbb. in Ach. Meth. Suppl. 17. (1803.) Lapp. 465. Nyl. Scand. 272.

FIG :—Hepp Sporen t. 11. f. 94.

EXS :—Paler thallus :—Hepp 94. Arn. 51. Zw. 29. Leight. 34. Schaer. 590.

Rufo-fuscescent thallus :—Fellm. 215. 216. Schaer. 522. Anzi Langob. 245. Hepp 689. Zw. 212.

GEOG. DISTRIB :—France, Switzerland, Germany, Hungary, Italy, Bavaria, E. Lapland.

BOT. PROV :—2...7...10...19...31.

ENGLAND :—Isle of Wight ! *Rev. T. Salwey*. Cleveland Lodge ; *Mr. Baker*. near Ayton, Cleveland. *Mr. Mudd*.

IRELAND :—Blackwater Bridge and Dunkerron. *Dr. Taylor*. Curraghmore. *Adm. Jones*. Connor Cliffs and Caher, Kerry ; Ballinhassig Glen, Cork. *Mr. Carroll*.

WALES :—Pen Trwyn ! Great Orme's Head.

CHANNEL ISLANDS :—Rozel Bay ! Jersey. *Mr. Larbalestier*.

Var. *papillosa*, Ach. pale-greyish-brown, subtartareous, rugulose, continuous or rimulose ; apothecia large, hemispherical, truncate, semi-immersed in thalline elevations ; ostiolum black, denuded ; epithecium poriform, large, impressed ; spores larger than in var. *athibola*.

On rocks, rare.

SYN :—Ach. L. U. 286. (1810.) Leight. Ang. Lich. 54.

FIG :—Leight. Ang. Lich. t. 24. f. 1.

EXS :—Zw. 361.

GEOG. DISTRIB :—Switzerland, Germany.

BOT. PROV :—1...3...11...19.

ENGLAND :—Hartlepool, Durham. *Mr. Mudd*. Mary Church, Torquay. *Mr. Parfitt*. Inworth, Essex. *Mr. Varcune*. Saltash, Devon. *Mr. Holmes*.

IRELAND :—Dunkerron Mountain ! *Dr. Taylor*.

Var. *acrotella*, Ach. pale-brown or greyish-brown or blackish, thin, continuous or evanescent ; apothecia black, minute, prominent, hemispherical ; perithecium dimidiate ; spores of the same size as those of *athibola*.

On stones, not common.

SYN :—Ach. Meth. 125. (1803.) Nyl. Scand. 293. *V. mutabilis*, Borr. Leight. Ang. Lich. 55. in part.

FIG :—E. Bot. t. 1712.

EXS :—Arn. 53. 102.

GEOG. DISTRIB :—Sweden, Germany.

BOT. PROV :—2...10, 11...19...30.

ENGLAND :—SUSSEX ! *Mr. Borrer*. near Ayton. *Mr. Baker*. Teesdale and Weardale, Durham. *Mr. Winch*.

IRELAND :—Near Bantry. *Miss Hutchins.* near Belfast. *Mr. Templeton.* Carig and Dunkerron, Kerry. *Dr. Taylor.* Ballinhassig, Cork. *Mr. Carroll.*

8. *V. mutabilis*, Borr. *warm-umber-coloured, like a dark-brown oily stain*, thin, filmy, membranaceous, continuous, smooth, sub-determinate or effuse, often nearly evanescent; *apothecia brownish-black*, minute, scattered, numerous, prominent, hemispherical, *opaque*, sometimes polished and shining, internally pale; epithecium minutely poriform; perithecium dimidiate; paraphyses none; spores 8, colourless, oblong, simple, *very minute*, half the size of those of *V. acrotella*.

On stones, rocks and pebbles, not common. 1807.

SYN :—Leight. Ang. Lich. 55. excl. syn. (1851).

FIG :—Leight. l. c. t. 24. f. 3.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1, 2, 3...5...7.

ENGLAND :—Sussex! *Mr. Borrer.* (1807.) Bagley Wood! near Oxford. *Mr. Jenner.* Salcombe Hill, Sidmouth; Exmouth. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.* Wrekin Hill!; Alberbury!; near Shrewsbury!; Shropshire.

WALES :—Craig Breiddin! Montgomeryshire.

9. *V. lævata*, Ach. *dirty-whitish or pale-greyish-brown*, thickish, *tartareo-cartilaginous*, smooth, continuous or eventually rimulose or rimuloso-areolate; *apothecia immersed* in, and covered by the thallus, small, partially emerging; *ostiolum black and polished*, conical, more or less denuded; epithecium poriform, impressed; *perithecium* thickish, black, *entire*; spores 8, colourless, elliptical, simple, moderately large; paraphyses none; gelatina hymenea vinous-red with iodine.

Rocky beds of mountain streams, not common. 1830.

SYN :—Ach. L. U. 284. (1810.) Syn. 94. Leight. Ang. Lich. 44.

FIG :—E. Bot. Suppl. t. 2623. f. 2. Leight. Ang. Lich. t. 19. f. 1. & 2.

EXS :—Leight. 198. Mudd 272. 273. Rabh. 774. M. & N. 952.

GEOG. DISTRIB :—Germany.

BOT. PROV :—5...7...10, 11...19.

ENGLAND :—North of England!; Teesdale!; Tyne near Newcastle! *Mr. Robertson.* (1830.) near Ayton! Airyholme Wood! Cleveland. *Mr. Mudd.* Bishops Stow, Torquay. *Mr. Parfitt.* River Oney between Abdon and Tugford! River Morda under Craigforda, Shropshire!

IRELAND :—Killarney. *Sir T. Gage.* Middle Road! and Sunday's Well Weirs! near Cork. *Mr. Carroll.* Dunkerron! *Dr. Taylor.*

WALES :—Between Llangollen and Corwen!; Barmouth!

10. *V. prominula*. Nyl. greyish-white or pale-brown, thin, tartareous, continuous, rugulose, effuse; apothecia black, large, prominent, subglobose, scattered; epithecium very slightly depressed, poriform; perithecium entire; spores 8, colourless, broadly oblong or elliptical, simple, granular.

On maritime rocks, rare.

SYN:—Nyl. in litt. Mudd Man. 291. (1861.) Carroll in Seem. Journ. Bot. 4. 25.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1...19...22.

ENGLAND:—Exmouth. Mr. Parfitt.

IRELAND:—Derryquin, Kerry. Dr. Taylor. In a cave at the Diamond rocks, Kilkee, Clare. Mr. Carroll.

\*\*\* *Thallus rimuloso-areolate*.

11. *V. maura*, Whlrb. coal-black or dark-reddish-black, thick, smooth, minutely coarsely rimuloso-areolate, somewhat polished and shining, areolæ either smooth or covered with very minute papillæ or elevated points, their margin slightly raised into a sharp elevated rim; apothecia entirely immersed in, and covered by the thallus, moderate, hemispherical, scattered; ostiolum more or less elevated and denuded; epithecium large, poriform; perithecium dimidiate, spreading widely at the base, inner tunic black; paraphyses none; spores 8, colourless, oblong, simple; gelatina hymenea vinous-red with iodine.

On maritime rocks, not common. 1812.

*V. arctina*, Whlrb. has no other character than the punctato-scabrid appearance of the areolæ, but this is more or less observable and intermixed with smooth areolæ on all specimens of *V. maura*.

SYN:—Whlrb. in Ach. Meth. Suppl. 19. (1803.) Nyl. Scand. 273. Leight. Ang. Lich. 59.

FIG:—E. Bot. t. 2456. Leight. Ang. Lich. t. 25. f. 2.

EXS:—Leight. 33. in part. Hepp 716. Fellm. 213. 214.

GEOG. DISTRIB:—Europe, Norway, Finnmark, E. Lapland. E. Indies.

BOT. PROV:—1...7...11.. 14, 15...18...30, 31.

ENGLAND:—Torquay. Mr. Parfitt. Islands near Bamburgh! Northumberland. Mr. Borrer. Black Hall rocks near Hartlepool, Durham. Mr. Mudd. Boldon, Cleadon, Castle Eden Dene; Teesdale, Durham; Dunstanborough and Holy Island, Northumberland. Mr. Winch.

SCOTLAND:—Dunbar! Mr. Borrer. Newhaven! Leith. Dr. Gre

ville. Kincardine. *Rev. J. M. Crombie*. Stennis, Orkney. *Dr. Lindsay*.

IRELAND :—Ardglass co. Down. *Dr. Maingay*. Bantry. *Dr. Taylor*.

WALES :—Barmouth! *Rev. T. Salwey*. Black Stones, ! Conway Bay.

CHANNEL ISLANDS :—Jerbourg, Guernsey ; Noirmont ! Jersey. Common on all the Islands. *Mr. Larbalestier*.

12. *V. mauroides*, Schær. *dark-umber or nearly black*, thin, uniform, *rimuloso-areolate*, smooth ; *apothecia* minute, very numerous and crowded, innate, *at length emersed*, hemispherico-conoid, black, somewhat shining ; *epithecium* poriform ; *perithecium dimidiate*, not spreading at the base, inner tunic thin, dark-brown ; paraphyses crowded, indistinct ; spores 8, colourless, oblong, simple.

On rocks and walls, frequent. 1805.

SYN :—Schær. Spicil. 335. (1836.) Enum. 215. *V. umbrina*, Leight. Ang. Lich. 52.

FIG :—E. Bot. t. 1499. Leight. Ang. Lich. t. 23. f. 2.

EXS :—Leight. 101.

GEOG. DISTRIB :—Switzerland, Italy.

BOT. PROV :—1, 2...4, 5 ..7...10...12.

ENGLAND :—Gorleston Church, Suffolk ! *Mr. Turner*. (1805.) Sussex ! *Mr. Borrer*. Nent Force ! Cumberland. *Mr. Robertson*. Oswestry ! Shropshire ; Penzance. *Rev. T. Salwey*. Ayton and Landraugh, Cleveland. *Mr. Mudd*. Babbicombe near Torquay. *Dr. Deakin*. Exmouth. *Mr. Parfitt*. Iligh Rock ! near Bridgnorth ; Uffington ! Mynydd-y-Myfyr ! Shropshire.

WALES :—Dolgelley. *Dr. Holl*. Aberdovey ! *Rev. A. Bloom*. Llandeilo ! between Corwen and Bala ! Diganwy ! near Conway, Capel Curig. !

13. *V. nigrescens*, (Pers.) *dark-brown or nearly black*, thickish, crustaceous, *rimuloso-areolate or uneven*, loose and crumbling, raised into low warty elevations around the apothecia, sub-determinate ; *apothecia* dull-black. *large*, more or less numerous and crowded, hemispherical, *thin*, *apices generally visible*, though sometimes covered by the thallus, their basal circumference surrounded by the scaly elevations of the thallus ; *perithecium dimidiate*, *spreading at the base* ; paraphyses none : spores 8, colourless, oblong, simple ; gelatina hymenea vinous-red with iodine.

On calcareous rocks, frequent.

SYN :—Pers. in Ust. Ann. Bot. st. 14. p. 36. (1795.) Leight. Ang. Lich. 63.

FIG :—Leight. Ang. Lich. t. 27. f. 1.

EXS :—M. & N. 1065. Mudd. 277. Schær. 439. Anzi It. S. 365. 366.

GEOG. DISTRIB :—Sweden, Germany, Switzerland, France, Austria, Italy, Algeria, Africa, N. America.

BOT. PROV :—1, 2, 3...5 ..7, 8...10...15...17...(19—30).. 31.

ENGLAND :—Sussex! *Mr. Borrer*. Carlton Bank! Cleveland. *Mr. Mudd*. Gopsal! Leicestershire. *Rev. A. Bloxam*. Torquay! *Dr. Deakin*. Isle of Wight!; Penzance!; Lamorna!; Cornwall. *Rev. T. Salwey*. Kelvedon, Essex. *Mr. Varenne*. Plymouth. *Mr. Holmes*. Bromsgrove Lickey! Worcestershire; Ludlow! Steeraway! Wrekin! Shropshire.

SCOTLAND :—Near Aberdeen, Stirling; Craig Guie; Morrone; Craig Tulloch. *Rev. J. M. Crombie*.

IRELAND :—On calcareous rocks. *Mr. Carroll*.

WALES :—Penmaenmawr!

CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier*.

14. *V. plumbea*, Ach. *plumbeo-cinerascent* or *lead-coloured* or *greyish-brown*, thickish, determinate, smooth, *rimulose* or *rimuloso-areolate*; *apothecia* black, small, *immersed*, *slightly prominent*; *ostiolum* depressed; *epithecium* poriform; *perithecium* thick, *entire*; spores 8, colourless, ellipsoid or oblong, simple, small; paraphyses none; *gelatina hymenea* vinous-red with iodine.

On calcareous rocks, not common. 1813.

SYN :—Ach. L. f. U. 285. (1810.) Nyl. Scand. 271.

FIG :—E. Bot. t. 2540. Leight. Ang. Lich. t. 19. f. 5.

EXS :—Schær. 102. 643. Hepp 223. Mudd 275. Zw. 248.

GEOG. DISTRIB :—Switzerland, Austria, Italy, Germany, Bavaria.

BOT. PROV :—1...5...10, 11...16 ..19.. 24 . 30.

ENGLAND :—Chedder! Somersetshire. *Mr. Borrer*, (1813.) near Middleton! Teesdale. *Rev. J. Harriman*. Hartlepool, Durham; Newton Wood! Cleveland. *Mr. Mudd*. Wenlock Priory!; Llanymynech Hill! Shropshire.

SCOTLAND :—Appin. *Rev. J. M. Crombie*.

IRELAND :—Near Belfast. *Mr. Templeton*. Dunkerron. *Dr. Taylor*. Dromoland, co. Clare. *Mr. Carroll*.

15. *V. thelostoma*, *Harrim. cinereo-rufous*, tartareous, thin, *continuous*, *minutely rimuloso-areolate*, determinate; *apothecia* rufous-brown, *verrucæform*, elevated, sessile, *hemispherical*, *depressed and umbonate* in the centre; *perithecium* entire, pale below, rufous-brown above; para-



physes distinct ; spores 8, colourless, ellipsoid, simple.

On whinstone rocks, very rare. 1807.

SYN :—Harriman in Winch Bot. Guide, v. 2. p. 44. (1807.) *Pyrenula umbonata*, Ach. L. U. 316. Syn. 121. *Segestrella thelostoma*, Leight. Ang. Lich. 34.

FIG :—E. Bot. 2153. Leight. Ang. Lich. t. 15. f. 2.

GEOG. DISTRIBUTION :—Europe.

BOT. PROV :—11.

ENGLAND :—Near Eglestone, Durham! *Rev. J. Harriman.* (1807.)

\*\*\*\* *Thallus areolato-diffract.*

16. *V. fuscella*, Turn. dark-greyish-brown, crustaceous, thickish, *areolato-diffract*, nigro-limitate, *areolæ smooth, intersected with minute dark lines from the predominant hypothallus* ; apothecia minute, immersed in the areolæ ; *ostiolum nearly plane*, depressed ; *epithecium poriform* ; *perithecium entire, pale* ; paraphyses none ; spores 8, colourless, narrow-oblong, simple.

On walls &c. rare. 1804.

SYN :—Turn. in Linn. Trans. 7. p. 90. (1804.) Ach. L. U. 289. Leight. Ang. Lich. 23.

FIG :—E. Bot. t. 1500. Leight. Ang. Lich. t. 7. f. 2.

EXS :—Arn. 388. Hepp 90. Mudd 276.

GEOG. DISTRIBUTION :—Germany, Switzerland, Hungary, Bavaria.

BOT. PROV :—1, 2...4...11...13, 14, 15...19...31.

ENGLAND :—Gorleston Church, Norfolk. *Mr. Turner.* (1804.) Sussex! *Mr. Borrer.* near Stanhope! Durham. *Mr. Mudd.* Penzance. *Mr. Curnow.* Malvern. *Mr. Lees.*

SCOTLAND :—Central parts. *Rev. J. M. Crombie.*

IRELAND :—Dunkerron Castle, co. Kerry. *Dr. Taylor.*

CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.*

17. *V. polysticta*, Borr. creamy-white, somewhat glaucescent, crustaceous, thin, *areolato-diffract*, nigro-limitate, *areolæ smooth, plane, with a somewhat elevated thin black edge from the predominant hypothallus* ; apothecia black, small, immersed in the areolæ ; *ostiolum prominent, sub-convex* ; *perithecium entire, black* ; spores 8, colourless, narrow-oblong, simple, of the same size as those of *fuscella*.

On walls &c. rare. 1832.

This and *fuscella* may be only states of the same lichen.

SYN :—Borr. in E. Bot. Suppl. 2741. (1832.) Leight. Ang. Lich. 49.

FIG :—E. Bot. Suppl. t. 2741. Leight. Ang. Lich. t. 21. f. 5.

Exs :—Anzi It. S. 363. Nyl. 147.

GEOG. DISTRIB :—Italy, Bavaria, Germany, France.

BOT. PROV :—1, 2...4...10...23.

ENGLAND :—Sussex ! *Mr. Borrer*. (1832.) Suffolk ! *Rev. G. R. Leathes*. Isle of Wight ! *Rev. T. Salwey*. Rievaulx Abbey ! Yorkshire. *Mr. Mudd*. Exeter. *Mr. Parfitt*.

IRELAND :—Eastern Counties. *Dr. Moore*.

18. *V. glaucina*, (Ach.) *glaucous* or *leaden-grey*, thickish, crustaceous, *areolato-diffract*, *nigro-fusco-limitate*, *areolæ smooth*, *plane* or *plano-convex*, *edged with the predominant nigro-fuscous hypothallus* ; *apothecia blackish*, immersed, *two or more on each areola*, to which *by their confluence they often give a blotchy appearance* ; *ostiolum plane*, flat ; *perithecium entire*, black ; spores 8, colourless, elliptical, simple, double the size of those of *fuscella* and *polysticta*.

On calcareous rocks and walls, frequent.

SYN :—Ach. Syn. 94. (1817.) Mudd Man. 289.

Exs :—Anzi Ital. S. 362.

GEOG. DISTRIB :—Italy, Hungary.

BOT. PROV :—1...5...7...11...19...28.

ENGLAND :—Teesdale, Durham. *Rev. J. Harriman*. South side of river Wear opposite Stanhope, Durham. *Mr. Mudd*. Plymouth. *Mr. Holmes*. Wenlock Priory ! Llanymynech Hill ! Craigforda ! Shropshire.

IRELAND :—Near Bantry. *Miss Hutchins*. Sheep walk, Armagh. *Adm. Jones*.

WALES :—Eglswg Rocks ! near Llangollen ; Great Orme's Head !

19. *V. macrostoma*, (Duf.) *olive-tawny*, thick, crustaceous, *areolato-diffract*, *areolæ* rather large, somewhat *rudded*, or raised into small irregular warts or scaly elevations ; *apothecia black*, *tolerably large*, one or several *immersed* in each areola ; *ostiolum* more or less prominent, black ; *perithecium entire*, black ; spores 8, colourless, elliptical, simple.

On walls and mortar, rare. 1851.

SYN :—D. C. Fl. Fr. 3. vol. 2. 319. (1805.) Leight. Ang. Lich. 48.

FIG :—Leight. Ang. Lich. t. 21. f. 4.

Exs :—Larbal. 97. Mass. 194. Zw. 214. Nyl. 94. Mudd 278. Anzi Venet. 156.

GEOG. DISTRIB :—France, Spain, Italy, Germany.

BOT. PROV :—1, 2...5...7, 8...10...15...31.

ENGLAND :—Sussex ! *Mr. Borrer*. (1851.) Thringstone ! Leicestershire. *Rev. Ch. Babington*. Guisbro' Church ! Cleveland. *Mr. Mudd*. Plymouth ! *Mr. Holmes*. Penzance. *Mr. Curnow*. Breckon

Hill ! Leicestershire ; Pulley ! near Shrewsbury, Shropshire.

SCOTLAND :—Craig Tulloch. *Rev. J. M. Crombie.*

WALES :—Llanaber ! near Barmouth.

CHANNEL ISLANDS :—St. Aubin's ! Jersey, and on all the Islands. *Mr. Larbalestier.*

20. *V. ochrostoma*, Borr. *dusky-cream or grey or olivaceous or brownish-black or umber*, moderately thick, crustaceous, verrucoso-rugose, areolato-diffract ; apothecia black, numerous, minute, entirely immersed ; ostiolum black, slightly elevated, hemispherico-conoid ; epithecium poriform ; perithecium entire, thin, black ; spores 8, colourless, elliptical, simple.

On plastered walls, rare. 1851.

SYN :—*Sagedia*, Leight. Ang. Lich. 23. (1851.)

FIG :—Leight. Ang. Lich. t. 7. f. 4.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2.

ENGLAND :—Sussex ! *Mr. Borrer.* (1851.)

21. *V. viridula*, (Schrad.) *pale-brown or greenish olive-brown*, thickish, tartareous, areolato-diffract, areola polygonal, granulato-crenate, smooth or rugose or verruculose, effuse ; apothecia black, large, semi-immersed, conical ; perithecium dimidiate, very thick and black, inner tunic thin, membranaceous and black ; spores 8, colourless, broadly elliptical, simple, granular, very large.

On mortar, old walls, rocks, &c. frequent. 1798.

SYN :—*Endocarpon*, Schrad. Spic. 192 (1794.) *Verrucaria*, Ach. L. U. 675. *Sagedia*, Leight. Ang. Lich. 23.

FIG :—E. Bot. t. 533, (bad) Leight. Ang Lich. t. 7. f. 3.

EXS :—Leight. 229. Mudd 279. Nyl. 95. Hepp 91. 943. Mass. 21. 209. 331. Arn. 101. 170. b. 367. 81. 365. Anzi Venet. 157. 160. 159. Zw. 404. Rabh. 875. Anzi Ital. S. 377. 367. Anzi Etr. 39.

GEOG. DISTRIB :—Germany, Bavaria, Italy, Hungary, Africa, N. America.

BOT. PROV :—1, 2, 3, 4, 5...7, 8...10, 11...15...19...26, 27...31.

ENGLAND :—Yarmouth. *Mr. Turner.* (1798.) Sussex ! *Mr. Borrer.* Hartlepool, Durham ; near Ayton ! Guisboro' ! ; Airyholme ! ; Stokesley ! ; Cleveland. *Mr. Mudd.* Twyeross ! Breedon Hill ! Leicestershire. *Rev. A. Blomam.* Norton and Bevere ! Worcester. *Dr. Holl.* Torquay ! *Dr. Deakin.* Shanklin Church, Isle of Wight ! *Rev. T. Salwey.* Bathaston ! *Mr. Broome.* Countess Weir Bridge Westleigh ! Exeter. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.* Shiffnal ! Comley ! Wenlock ! High Rock near Bridgnorth ! Hope Valley ! all in Shropshire ; Aymestry ! Herefordshire.

SCOTLAND :—Spittall of Glenshee, Perthshire. *Dr. Lindsay.* near Aberdeen ; Cove, Kincardine. *Rev. J. M. Crombie.*

IRELAND:—Castle Taylor, Galway. *Dr. Moore*. Great Island and Rossscarberry, Cork. *Mr. Carroll*.

WALES:—Between Llangollen and Corwen! near Dolgelley!

CHANNEL ISLANDS:—Common on all the Islands. *Mr. Lurbaletier*.

\*\*\*\*\* *Thallus pulverulent*.

† *Apothecia semi-immersed, prominent*.

22. *V. murina*, Leight. mouse-coloured or cinereo-griseous, thin, tartareous, *pulverulent*, effuse; *apothecia* dark-brownish-black, *prominent, semi-immersed*, hemispherico-convex; *perithecium* thick, black, *entire*; *epithecium* poriform, umbilicate; spores 8, colourless, elliptical, simple; paraphyses indistinct; gelatina hymenea vinous-red with iodine.

On calcareous rocks, rare. 1836.

SYN:—Leight. Ang. Lich. 44. (1851).

FIG:—Leight. l. c. t. 19. f. 3.

EXS:—Hepp 430. Arn. 198. 285.

GEOG. DISTRIB:—Germany, Sweden.

BOT. PROV:—1, 2...5...19

ENGLAND:—St. Ives! Cornwall; Shanklin, Isle of Wight. *Rev. T. Salwey*. Sussex! *Mr. Borrer*. Torquay! *Dr. Deakin*. near Exeter. *Mr. Parfitt*. Mynydd-y-Myfyr! Oswestry! Abdon Burf! Shropshire,

IRELAND:—Dunkerron! *Dr. Taylor*. (1836.) Monkstown! Glanmire! near Cork! *Mr. Carroll*.

23. *V. rupestris*, Schrad. white, greyish-white or pale-brown, thin, tartareous, pulverulent or sub-furfuraceous, effuse; *apothecia* black, moderate, numerous, *semi-immersed, prominent*, hemispherical; *perithecium* dimidiate, more or less spreading at the base, *inner tunic* very thin, *pale-brown*; spores 8, colourless, elliptico-oblong, simple.

On flints, chalk, sandstone, &c. frequent.

SYN:—Schrad. Spic. 109. (1794.) Leight. Ang. Lich. 60.

FIG:—Leight. Ang. Lich. t. 25. f. 4.

EXS:—Leight. 140. Schaer. 103. Hepp 224. Arn. 175.

GEOG. DISTRIB:—Bavaria, Italy, Pyrenees, Africa, N. America.

BOT. PROV:—1, 2, 3...5...7, 8...15...(19—30)...31.

ENGLAND:—Sussex! *Mr. Borrer*. Ayton! Cleveland. *Mr. Mudd*. Twycross! Leicestershire. *Rev. A. Bloom*. Kelvedon, Essex. *Mr. Farman*. Cleadon, and Boldon Hills, Castle Eden, Middleton-in-Teesdale, between Widdy Bank and Coudron Snout, Durham. *Mr. Winch*. Plymouth. *Mr. Holmes*. Malvern. *Mr. Lees*. Bromsgrove. Lickey! Worcestershire.

SCOTLAND:—Frequent. *Rev. J. M. Crombie*.



IRELAND :—Rocks and walls, common. *Mr. Carroll.*

WALES :—Aberdovey ! *Rev. A. Bloxam.* between Llangollen and Corwen !

CHANNEL ISLANDS :—La Moie, Jersey ; Guernsey. *Mr. LARBALÉSTIER.*

Var. *muralis*, Ach. *greyish-white, tartareo-farinose*, thin, effuse, often evanescent ; apothecia black, semi-immersed, hemispherical ; perithecium dimidiate, more or less spreading at the base, inner tunic pale-brown ; spores as in the type.

On brick walls, mortar. &c. frequent.

SYN :—Ach. Meth. 115. (1803.) *V. patula*, Leight. Ang. Lich. 61.

FIG :—Leight. Ang. Lich. t. 26. f. 1.

EXS :—Fries 357. Th. M. Fries 25. Arn. 174.

GEOG. DISTRIB :—Sweden, Bavaria, Switzerland, Italy, Austria, Hungary.

BOT. PROV :—1, 2, 3...5...8...23.. 31.

ENGLAND :—Sussex. *Mr. Borrer.* Madron ! Newlyn ! Cornwall. *Rev. T. Salwey.* Pennsylvania, Exeter. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.* Malvern. *Mr. Lees.* Pulley ! ; Wolverley Bridge ! near Loppington ; Middle ! ; Bayston Hill ! Burlton ! Shropshire ; Breedon Hill ! Leicestershire.

IRELAND :—Near Dublin. *Adm. Jones.*

CHANNEL ISLANDS :—Jersey. *Mr. LARBALÉSTIER.*

Var. *subalbicans*, Leight. *greyish-white*, very thin, *continuous and crumbly*, effuse or *evanescent* ; apothecia black, numerous and crowded, *large, prominent*, semi-immersed, *conical or hemispherical*, more or less rugged and pruinose ; epithecium poriform, dilated ; perithecium dimidiate, spreading at the base, *inner tunic thin, black* ; spores as in the type.

On mortar, plastered walls, rocks, &c. frequent. 1851.

SYN :—Leight. Ang. Lich. 56. (1851).

FIG :—Leight. l. c. t. 25. f. 1.

EXS :—Leight. 200.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1, 2 ..7.. 10.

ENGLAND :—Sussex ! *Mr. Borrer* (1851.) Rocky Valley ! Torquay. *Dr. Deakin.* Ayton ! Cleveland. *Mr. Mudd.* Countess Weir Bridge, Exeter. *Mr. Parfitt.* Malvern. *Mr. Lees.*

WALES :—Cell-fechan ! Barmouth. *Rev. T. Salwey.* Bangor !

24. *V. integra*, Nyl. *white* or slightly *greyish-white*, thin, *sub-crustaceous, continuous, tartareo-sub-farinose* ;



*apothecia* black, numerous and crowded, moderate, *semi-immersed*, *depresso-hemispherical*; *epithecium* poriform, often dilated; *perithecium* dimidiate, very thick, black, inner tunic black and tough; paraphyses none; *spores* 8, colourless, broadly elliptico-oblong, simple, granular, large, *double the size of those of V. rupestris*.

On sandstone, rare.

SYN:—*V. rupestris* var. *integra*, Nyl. Prodr. 183. (1857.) Pyren. 31. Scand. 276.

GEOG. DISTRIB:—France, Scandinavia, Lapland.

BOT. PROV:—2. 4...16...19.

ENGLAND:—Hurstpierpoint! Sussex. *Mr. Larbalestier*. Luccomb Chine! Shanklin, Isle of Wight. *Dr. Holl*. Northamptonshire. *Mr. Larbalestier*.

SCOTLAND:—Appin. *Rev. J. M. Crombie*.

IRELAND:—Near Cork. *Mr. Carroll*.

25. *V. pulposa*, Leight. *thallus* chroolepoid or evanescent; *apothecia* nigricant, sub-spherical, pulpose, polished, prominent; *epithecium* indistinct; *perithecium* dimidiate, nigricant; *spores* numerous, fuscous, oblong or irregularly globose, simple; paraphyses very short, crowded; *gelatina hymenea* untinged with iodine.

On old rails, rare. 1870.

GEOG. DISTRIB:—Europe.

BOT. PROV:—5.

ENGLAND:—Porthill! near Shrewsbury, Shropshire. (1870).

### †† *Apothecia insculpted*.

26. *V. calciseda*, D.C. white or greyish-white, thin, tartareous, pulverulent, effuse or evanescent; *apothecia* black, minute, very numerous, deeply immersed and insculpted in the *thallus* and rock; *ostiolum* depresso-hemispherical; *epithecium* poriform, often irregularly fissured; *perithecium* dimidiate, black, inner tunic black; paraphyses none; *spores* 8, colourless, elliptico-oblong, simple, granular; *gelatina hymenea* vinous-red with iodine.

On calcareous rocks, frequent.

SYN:—DC. Fl. Fr. 1. 317. (1805.) Mudd Man. 292. *Limboria sphinctrina*, Nyl. Pyren. 62.

EXS:—Leight. 30. Mudd 280. Schaer. 104. M. & N. 951. Anzi Ital. S. 373. 375. 376. Arn. 310. 309. 311.

GEOG. DISTRIB:—Switzerland, Bavaria, Italy, France.

BOT. PROV: 1..4, 5...7...10...15...(19—30).

ENGLAND :—Bilsdale ! Yorkshire. *Mr. Mudd.* Bury, Suffolk. *Mr. Larbalestier.* Chudleigh ; Berry Head, Devon. *Mr. Parfitt.* Llanymynech Hill ! Shropshire.

SCOTLAND :—Craig Guie ; Craig Tulloch. *Rev. J. M. Crombie.*

IRELAND :—On limestone, common. *Mr. Carroll.*

WALES :—Great Orme's Head !

Var. *purpurascens*, (Hffm.) thallus of a *pale-rose* or *rosy-purple* tinge ; apothecia larger.

On calcareous rocks, rare. 1861.

SYN :—Hoffm. Pl. Lich. 1. 74. (1790.) Nyl. Pyrenoc. 31. Mudd Man. 292.

FIG :—Hoffm. Pl. Lich. t. 15. f. 1. & t. 19. f. 3.

EXS :—Schær. 440. Mass. 207. Anzi Langob. 246.

GEOG. DISTRIB :—France, Switzerland, Pyrenees, Italy, Bavaria.

BOT. PROV :—1...11.

ENGLAND :—Castle Eden Dean, Durham. *Mr. Mudd.* (1861.) Exeter. *Mr. Parfitt.*

\*\*\*\*\* *Thallus squamulose.*

27. *V. tephroides*, (Ach.) *cinereous* or *albido-cinereous* or *cinereo-fuscescent*, *squamulose*, *squamulæ* adnate, smooth, *tessellato-areolate*, undulato-lobate ; apothecia black, minute, immersed ; ostiolum sub-hemispherical, slightly prominent ; epithecium poriform, dilated ; perithecium entire, thin, membranaceous, black ; spores 8, colourless, narrow-oblong, simple, sometimes pseudo-bilocular ; paraphyses indistinct ; gelatina hymenea vinous-red with iodine.

On the earth in alpine regions, rare. 1808.

SYN :—Ach. Prodr. 18. (1798.) Syn. 98. Nyl. Pyren. 17. Scand. 267. *Sagedia cinerea*, Leight. Ang. Lich. 22.

FIG :—E. Bot. t. 2013. Hepp Sporen t. 24. f. 221. f. 1.

EXS :—Schær. 647. Hepp 221. Fellm. 212. Zw. 103. Larbal. 96.

GEOG. DISTRIB :—Germany, Sweden, E. Lapland, Hungary, Switzerland, N. America.

BOT. PROV :—10.. 15...18...31.

ENGLAND :—Malham, Yorkshire, *Dr. Carrington.*

SCOTLAND :—Burgh Head in Island of Stronsa, 1 Orkneys. *Messrs. Borrer & Hooker.* (1808.) summit of Ben Lawers ! *Mr. Borrer.* Craig Guie. *Rev. J. M. Crombie.*

CHANNEL ISLANDS :—Grosnez Common, Jersey. *Mr. Larbalestier.*

Var. *cartilaginea*, Nyl. *cinereo-pallescent* or *fuscescent*, *squamulæ* firmer, sub-imbricate, sub-lobate, like

the thalline leaflets of *Cladonia pyxidata* v. *pocillum*; perithecium colourless.

On the earth, rare. 1866.

SYN:—Nyl. Coll. Gall. Mer. Pyr. 8. (1853.) Pyren. 18. Scand. 268. Carroll in Seem. Journ. Bot. 4. 34.

EXS:—Körb. 97. Arn. 78.

GEOG. DISTRIB:—Germany, Pyrenees, Sweden, Bavaria.

BOT. PROV:—15.

SCOTLAND:—Summit of Ben Lawers. Mr. Carroll. (1866).

### B. Spores 1-septate.

#### \* *Perithecium dimidiata*.

28. *V. cataractarum*, (Mudd.) greyish-green, very thin, sub-leprose or evanescent; apothecia nigro-fuscous, minute, nearly sessile, sub-globose, internally pale; perithecium dimidiata; paraphyses none; spores 8, colourless, elliptico-oblong, 1-septate, moderate; gelatina hymenea vinous-red with iodine.

On rocks in streams, rare.

SYN:—Mudd Man. 294. excl. syn. (1861).

EXS:—Mudd 281.

GEOG. DISTRIB:—Europe.

BOT. PROV:—10...19...23.

ENGLAND:—Near Ayton! Cleveland. Mr. Mudd.

IRELAND:—Rosscarbery, Cork; Connor Cliffs and Blackwater Bridge, Kerry. Mr. Carroll. Portrane. Dr. Moore.

29. *V. Borreri*, Leight. smoky-grey, somewhat pruinose, tartareous, continuous or rimulose, nigro-fuscolimitate; apothecia black, hemispherical, truncate, prominent, basally immersed, rather large, internally pale-brown; epithecium depresso-concave, surrounded by a narrow edge and central papilla; perithecium very thick, black, dimidiata, inner tunic brown; paraphyses distinct; filamenta ostiolaria distinct, short, minute; spores 8, colourless, broadly or rotundo-oblong or elliptical, 1-septate, coarsely granular.

On calcareous rocks, rare. 1833.

SYN:—Leight. Ang. Lich. 76. & 51. (1851).

FIG:—E. Bot. Suppl. 2791. Leight. Ang. Lich. t. 22. f. 4.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1...15.

ENGLAND:—Cheddar! Mr. Borrer.

SCOTLAND:—Ben Lawers. Adm. Jones. Morrone. Rev. J. M. Crombie.

30. *V. conoidea*, Fries. *greyish, more or less tinged with rose, tartareous, thin, somewhat powdery, continuous or rimulose, indeterminate; apothecia dull-brownish-black, pruinose, large, prominent, hemisphærico-conical, slightly basally immersed, internally white; ostiolum rugulose; epithecium papillate, minutely poriform, irregularly dehiscent; perithecium black, thinnish, dimidiate, spreading considerably at the base, inner tunic pale; paraphyses distinct, slender; spores 8, colourless, oblong or broadly ellipsoid, 1-septate, yellow or brownish with iodine.*

On calcareous rocks, frequent.

SYN:—Fries L. Ref. 432. (1831.) Nyl. Pyren. 353. Scand. 280.

*V. epipolea*, Leight. Ang. Lich. 61.

FIG:—E. Bot. Suppl. t. 2647. f. 3. Leight. Ang. Lich. t. 26. f. 2.

EXS:—Leight. 31. Mass. 319. Hepp 697. Anzi Lang. 239. Zw. 246. Fries 356. Mudd 284.

GEOG. DISTRIB:—Europe, Italy, Sweden, Hungary, Bavaria, Austria, Germany, Switzerland, France, Algeria.

BOT. PROV:—1...5...7...10, 11...15, 16...(19—30).

ENGLAND:—St. Vincents Rocks, Bristol. *Mr. Borrer*. North of England. *Rev. J. Harriman*. Craig-y-Rhiw! Oswestry! *Rev. T. Salwey*. Bath! *Mr. Broome*. Torquay! *Dr. Deakin*. Airyholme Wood! Ingleby! Pinchingthorp Wood! Cleveland. *Mr. Mudd*. Ingleborough. *Dr. Carrington*. Bilsdale, Yorkshire. *Mr. Baker*. Leigh Woods, Clifton. *Mr. Lorbalestier*. Bishopstowe, Torquay. *Mr. Parfitt*. Craigforda! Shropshire.

SCOTLAND:—Appin! Craig Guie. *Rev. J. M. Crombie*.

IRELAND:—Common. *Mr. Carroll*.

WALES:—Great Orme's Head!

31. *V. conformis*, Nyl. similar to *V. biformis*, but with the thallus albido-virescent; and the perithecium dimidiate, black.

On trees in sub-alpine regions, very rare. 1864.

SYN:—Nyl. in Flora 1864, p. 257. Crombie En. 119.

GEOG. DISTRIB:—France.

BOT. PROV:—19...31.

IRELAND:—Upper Lake, Killarney. *Mr. Carroll*. (1864).

A form (f. *rhypontoides*, Nyl.) occurs with thallus dark-bluish-black at Noirmont, Jersey. *Mr. Lorbalestier*.

32. *V. gemmata*, Ach. *white or whitish, thin, continuous, nearly smooth, sometimes rimulose; apothecia black, large, slightly immersed at the base, very prominent, hemispherical, convex, rugged, internally whitish; epithecium minute, poriform; perithecium thickish,*



black, *dimidiate*, inner tunic pale-brown; paraphyses distinct, long and slender; *spores* 8, colourless, *very broadly oblong*, 1-septate, large; spores and contents of asci yellow with a vinous tinge with iodine.

On trees, common. 1829.

SYN:—Ach. Meth. 120. (1803.) L. U. 278. Syn. 90. Nyl. Pyren. 53. Leight. Ang. Lich. 43.

FIG:—E. Bot. Suppl. t. 2617. fig. 2. Leight. Ang. Lich. t. 18. f. 4. & 5.

EXS:—Leight. 136. Zw. 31. Nyl. 93. M. & N. 1064. Mudd 285. Hepp 104. Bohl. 114. Schær. 105.

GEOG. DISTRIB:—Germany, France, Switzerland, Scandinavia, Hungary, Italy, N. America, Algeria, Brazil.

BOT. PROV:—1, 2, 3...5...7...11...19...31

ENGLAND:—Sussex! *Mr. Borrer*. (1829.) Plymouth. *Mr. Holmes*. Ragley Woods, Warwickshire. *Rev. W. S. Rufford*. Malvern. *Mr. Lees*. Ayton! Airyholme Wood! Cleveland. *Mr. Mudd*, on the Derwent, Durham and Northumberland. *Mr. Winch*. Llanforda, Shropshire. *Rev. T. Salwey*. Hartshill Hays! Warwickshire. *Rev. A. Bloxam*. Kings Kerswell near Torquay. *Mr. Parfitt*. Kelvedon, Essex. *Mr. Varenne*. New Forest. *Rev. J. M. Crombie*. Abdon! Loppington! Shropshire.

IRELAND:—Goat Island! Dyke! Dunkettle! Cork. *Mr. Carroll*

WALES:—Near Dolgelley! Gloddaeth! Carnarvonshire.

CHANNEL ISLANDS.—Jersey and Guernsey. *Mr. Larbalestier*.

33. *V. mesotropa*, Nyl. *pale*, thin, unequal; *apothecia black*, somewhat *turgid*; *perithecium convex*, *dimidiate*, black; *epithecium indistinct*; spores 8, colourless, ovoid or ovoideo-oblong, 1-septate, *very small*; paraphyses none; gelatina hymenea vinous-red with iodine.

On sub-alpine rocks, rare. 1866.

SYN:—Nyl. Flora 1866, p. 419. Leight. in Ann. and Mag. Nat. Hist. June, 1867.

GEOG. DISTRIB:—Europe.

BOT. PROV:—5.. 7.

ENGLAND:—Llanymynech Hill! Shropshire.

WALES:—Llyn Aran! Cader Idris. (1866).

34. *V. epidermidis*, Ach. *pale-yellow*, very thin, smooth and shining; *apothecia black*, minute, *sub-innate*, sessile, *hemispherico-conoid*; *perithecium dimidiate*, depressed and spreading at the base; paraphyses more or less *indistinct*; spores 8, colourless, linear-oblong, 1-septate, constricted, moderate.

On birch, common.

SYN:—Ach. L. U. 276. (1810.) Syn. 89. Leight. Ang. Lich. 40.



FIG :—Leight. Ang. Lich. t. 17. f. 3.

EXS :—Nyl. 148. Anzi 384. Bohl. 63.

GEOG. DISTRIB :—Throughout the World.

BOT. PROV :—1, 2...5...7...10, 11...15...(19—30)...31.

ENGLAND :—Sussex ! *Mr. Borrer*. New Forest ; Epping Forest. *Rev. J. M. Crombie*. Oswestry ! *Rev. T. Salwey*. Ayton ! Cleveland. *Mr. Mudd*. Midland Counties. *Mr. Purton*. Ragley Woods, Warwickshire. *Rev. W. S. Rufford*. Northumberland and Durham. *Mr. Winch*. Plymouth. *Mr. Holmes*. in various places near Shrewsbury !!

SCOTLAND :—Highlands, frequent. *Rev. J. M. Crombie*.

IRELAND :—Common. *Mr. Carroll*.

WALES :—Woods opposite Tanybwch Hotel, Capel Curig !

CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier*.

Var. *analepta*, Ach. dark-olive or copper-coloured.

On oaks &c. common.

SYN :—Ach. Meth. 119. (1803.) Leight. Ang. Lich. 40.

FIG :—E. Bot. t. 1848.

GEOG. DISTRIB :—Throughout the World.

BOT. PROV :—1...5...10...19...31.

ENGLAND :—Ross Hall, ! Shropshire. *Prof. Ch. Babington*. Cliff-rigg ! Hobhole ! Cleveland. *Mr. Mudd*. Haldon, Exeter. *Mr. Parfitt*. Midland Counties. *Mr. Purton*. various places near Shrewsbury, Shropshire !

IRELAND :—Dunscombe's Wood ! ; Glanmire ! Cork. *Mr. Carroll*.

CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier*.

forma *fallax*, Nyl. similar to *analepta*, but with very distinct paraphyses.

On oaks &c. common.

SYN :—Nyl. Obs. Holm. 1852. p. 178. Scand. 281.

EXS :—Fellm. 221. 222. Leight. 29. Mudd. 292. Bohl. 66. Körb. 295.

GEOG. DISTRIB :—Europe, Scandinavia.

BOT. PROV :—1, 2, 3...5...7...10...31.

ENGLAND :—Sussex ! *Mr. Borrer*. Hobhole ! Cleveland. *Mr. Mudd*. Leigh Woods, Clifton. *Mr. Larbalestier*. Stoke Wood, Exeter. *Mr. Parfitt*. Mile End near Colchester, Essex. *Mr. Varcene*. Nesscliffe Hill ! Haughmond Hill ! Shropshire.

WALES :—Moel-y-Golfa ! Montgomeryshire ; Capel Curig !

CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier*.

; Var. *cinereo-pruinosa*, Schaer. *cinereo-rufescent* or *cream-coloured*, thin, effuse ; *apothecia* hemispherical, minute, *innate*, *thinly covered with the thallus*, giving them a *cinereo-pruinose appearance*, sometimes naked ; *perithe-*

cium dimidiate ; paraphyses slender, distinct ; spores 8, colourless, in form and size as in *V. epidermidis*.

On various trees, not common.

SYN :—Schaer. Spicil. 342. (1836.) Enum. 221.

FIG :—Hepp Sporen t. 13. f. 105, 106. 107.

EXS :—Arn. 133. 373. Hepp 105. 106. 107. Mudd 297. Anzi Langob. 437. Venet. 129. Zw. 420. Leight. 197.

GEOG. DISTRIB :—Switzerland, France, Pyrenees, Italy, Germany.

BOT. PROV :—1...7...10...(19—30).

ENGLAND :—Near Ayton ! Cleveland. *Mr. Mudd*. Ilsham Wood near Torquay, Devon. *Dr. Deakin*. Malvern. *Mr. Lees*.

IRELAND :—Frequent. *Mr. Carroll*.

WALES :—Near Dolgelley !

35. *V. cinerea*, (Pers.) greyish-olive, thin, continuous, smooth ; apothecia black, small, numerous, innato-sessile, hemispherico-convex ; perithecium dimidiate, incurved at the base ; paraphyses distinct ; spores 8, colourless, elongato-oblong, slightly tapered towards each extremity, 1-septate, constricted, large, 4 times the size of those of *V. epidermidis*,

On trees, not frequent. 1808.

SYN :—Pers. in Ust. Ann. st. 7. p. 28. (1794.) Leight. Ang. Lich. 39.

FIG :—E. Bot. t. 1891. Leight. Ang. Lich. t. 17. f. 2.

EXS :—Leight. 343. Mudd 295.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1, 2, 3...5...7...10...19.

ENGLAND :—New Forest, Hants. *Mr. Lyell*. (1808.) Sussex. *Mr. Borrer*. Essex ! *Mr. Piggott*. Oswestry ! *Rev. T. Salwey*. Kildale ! ; Newton Wood ! ; Easby ! ; Lanbraughrigg ! ; Westerdale ! ; Cleveland. *Mr. Mudd*. Whitstone, Exeter. *Mr. Parfitt*. Haughmond Hill ! Shropshire.

IRELAND :—Glengariff ! ; Cusquinny Goat Island ! ; Old Court ! near Cork. *Mr. Carroll*.

WALES :—Torrent Walk ! Dolgelley.

36. *V. punctiformis*, Ach. dark-olive or brown, very thin, effuse ; apothecia black and shining, minute, innato-sessile, hemispherico-conoid, spreading at the base ; perithecium dimidiate, incurved ; epithecium a rather large impressed pore ; paraphyses none ; spores 8, colourless, lineari-oblong, 1-septate, very minute.

On trees, not common. 1812.

SYN :—Ach. Prodr. 18. (1798.) Leight. Ang. Lich. 41.

FIG :—E. Bot. 2412. Leight. Ang. Lich. t. 17. f. 5.

EXS :—Mudd 296. Leight. 344.

GEOG. DISTRIB:—Sweden, Germany, Switzerland, France.

BOT. PROV :—1, 2...5...10, 11...19...21.

ENGLAND :—Sussex! *Mr. Borrer*. (1812.) Cliffrigg! Hoggarts Wood! Ingleby, Cleveland. *Mr. Mudd*. Exeter. *Mr. Parfitt*. Northumberland and Durham. *Mr. Winch*. Meole! near Shrewsbury.

IRELAND :—White point! near Queenstown; Cromaglown and Crogham, Killarney. *Mr. Carroll*. Armagh; Glengariff. *Adm. Jones*.

forma *tremulæ*, Ach. albo-cinerascent, unequal, slightly rimulose; apothecia most minute, much crowded, subconfluent, scarcely protuberant and surrounded at the base with the thallus.

On poplar, rare.

SYN :—Ach. L. U. 277. (1810).

GEOG. DISTRIB:—Sweden, France, Spain, Switzerland, N. America.

BOT. PROV :—19.

IRELAND :—Old Dromore, Kerry. *Adm. Jones*.

forma *elongatula*, Nyl. like *V. punctiformis*, or *atomaria*, Ach. but with longer clavato-fusiform, 1-septate, spores; apothecia most minute; peritheciium colourless in the lower part, paraphyses none.

On trees, rare. 1867.

SYN :—Nyl. in Flora 1868. p. 164. Crombie En. 120.

GEOG. DISTRIB :—Europe.

BOT. PROV :—19.

IRELAND :—Dinis, Killarney. *Mr. Carroll*. (1867).

forma *diminutula*, Nyl. apothecia most minute; spores oblong, 1-septate.

On trees, rare.

SYN :—Nyl. in Flora 1868. p. 164. Crombie En. 120.

GEOG. DISTRIB :—Europe.

BOT. PROV :—19.

IRELAND :—Turk Mountain, Killarney. *Mr. Carroll*. (1867).

37. *V. nitescens*, Salw. pale-brownish-white, thin, shining, smooth or subrimulose, subdeterminate; apothecia black, very minute, numerous, semi-immersed, hemispherico-globose; peritheciium diminute, incurved at the base; epithecium minute, poriform; paraphyses indistinct; spores 8, colourless, linear, 1-septate, constricted, cells with 2 nuclei; gelatina hymenea yellow with iodine.

On holly, rare. 1853.

SYN :—Salw. Obs. Penz. Lich. 110. (1853.) Mudd Man. 303.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1...10.

ENGLAND:—Trevayler! Cornwall. *Rev. T. Salvey.* (1853.) Hoggarts Wood; Ingleby; Westerdale, Cleveland. *Mr. Mudd.*

38. *V. Laburni*, Leight. *brown or brownish-black*, thin, smooth, *effuse*; *apothecia* black and shining, *minute*, *semi-immersed*, hemispherical; *perithecium dimidiate*; *epithecium* minute, poriform; paraphyses indistinct; *spores* 8, colourless, *linear*, 1-septate, *constricted*, *cells binucleolate*; *gelatina hymenea* yellow with iodine.

On laburnum, oak and alders, rare. 1854.

SYN:—Leight. Exs. 254. (1856).

ENS:—Leight. 254.

GEOG. DISTRIB:—Europe.

BOT. PROV:—5...7. 10...19.

ENGLAND:—Ayton! Cleveland. *Mr. Mudd.* (1854.) Stableford! near Bridgnorth, Shropshire.

IRELAND:—Dromore! Kerry. *Mr. Carroll.*

WALES:—Craig Breidden, ! Montgomeryshire.

39. *V. antecellens*, Nyl. *albido-cinerascent*, thin, smooth and shining, *effuse*; *apothecia* black, numerous, *minute*, *crowded*, hemispherical, *surrounded at the base with the thallus*; *ostiolum* more or less naked; *perithecium dimidiate*; paraphyses none; *spores* 8, colourless, *elongato-lineari-oblong*, 1-septate, large; *asci* and *spores* red with iodine.

On trees, rare. 1865.

SYN:—Nyl. in Flora 1866. p. 86. Crombie En. 119.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1, 2.

ENGLAND:—Ivy Bridge, Devon; Tilgate Forest! Sussex. *Mr. Lorbalestier.* (1865.) New Forest, Hants. *Rev. J. M. Crombie.*

Var. *analeptoides*, Nyl. very similar externally to *analepta*; *spores* 1-or spuriously 3-5-septate; paraphyses lax.

On trees, rare. 1867.

SYN:—Nyl. in Flora 1867. p. 180. Carroll in Seem. Journ. Bot. 5. 260.

GEOG. DISTRIB:—Europe.

BOT. PROV:—19...26, 27.

IRELAND:—Turk Mount, Killarney; Loughcooter, co. Galway. *Mr. Carroll.* (1867).

40. *V. sublitoralis*, Leight. *thallus evanescent*; apo-

*thecia black and shining*, minute, *hemispherical*, scattered; *epithecium poriform*; *perithecium dimidiate*, black; *paraphyses few, distinct*; spores 8, colourless, linear-ovoid or oblong, obtuse, 1-septate, constricted, minute.

On limpet shells, (*Chthamalus stellatus*) on submerged maritime rocks, rare. 1857.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1...3.

ENGLAND:—Sandgate! near Folkestone. *Mr. Currey*. (1857.) between Seaton and Beer! on south coast of Devon. *Mr. Parfitt*.

41. *V. halizoa*, Leight. *nigricanti-macular*, thin, almost evanescent, effuse; *apothecia black and shining*, minute, *hemispherico-conoid*, scattered; *epithecium poriform*, often irregularly chinky; *perithecium black, dimidiate, incurved, nearly entire*; *paraphyses none*; spores 8, colourless, very minute, linear-ellipsoid or oblong, imperfectly and faintly 1-septate, binucleolate; *gelatina hymenea yellow with iodine*.

On submerged maritime rocks, rare. 1851.

GEOG. DISTRIB:—Europe.

BOT. PROV:—14.

SCOTLAND:—Joppa! near Portobello; Newhaven! near Leith, Edinburgh. *Dr. Greville*. (1851).

42. *V. elæina*, Borr. *greenish-olive*, very thin, tartareous, smooth or rimulose; *apothecia innate and covered by the thallus, eventually crumpept, innato-sessile*, hemispherico-conical; *ostiolum black, more or less denuded*; *epithecium rather large, poriform, umbilicate*; *perithecium dimidiate*, spreading and *acutely incurved at the base*; spores 8, colourless, linear-oblong, 1-septate.

On maritime slaty rocks, rare. 1812.

SYN:—Borr. under E. Bot. Suppl. 2623. f. 2. (1830.) Leight. Ang. Lich. 63.

FIG:—E. Bot. t. 2455. Leight. Ang. Lich. t. 27. f. 2.

GEOG. DISTRIB:—Europe.

BOT. PROV:—7...24 ..26.

IRELAND:—Western parts! *Miss Hutchins*. (1812).

WALES:—Aber Ty Gwyn! near Dolgelley. *Rev. T. Salwey*.

43. *V. immersa*, Leight. *white or pale-dirty-yellow or grey-ashy-white*, very thin, *tartareo-farinose*; *apothecia black, deeply incavato-immersed in the rock*, moderate, internally brownish; *ostiolum depressed*; *epithecium*



poriform; *perithecium dimidiate*, thick, carbonaceous, flattened, inner tunic black; paraphyses none; *spores* 8, colourless, linear-oblong, *constantly* 1-septate, large; *gelatina hymenea* red with iodine.

On calcareous rocks, frequent.

SYN :—Leight. Ang. Lich. 57. (1851.) Mudd Man. 295.

FIG :—Leight. Ang. Lich. t. 25. f. 2.

EXS :—Mudd 283. Schær. 103.

GEOG. DISTRIB :—Switzerland, Pyrenees, N. Zealand.

BOT. PROV :—1, 2 .5 .10, 11...15...19...30.

ENGLAND :—Sussex ! *Mr. Borrer*. Craigforda ! near Oswestry, Shropshire. *Rev. T. Salway*. Bilsdale ! Yorkshire. *Mr. Mudd*. Torquay ! Devon. *Dr. Deakin*. Barnard Castle ! Durham. *Mr. Robertson*. Ingleborough. *Dr. Carrington*. Craig-y-rhiw, ! Shropshire.

SCOTLAND :—N. W. slope of Morrone. *Adm. Jones*. Canlochan. *Rev. J. M. Crombie*.

IRELAND :—Belfast. *Mr. Thompson*. Sunday's Well ! Cork. *Mr. Carroll*. White Park, Antrim. *Dr. Moore*. Ardglass, co. Down. *Dr. Maingay*. Killarney. *Dr. Carrington*.

44. *V. cinerella*, Flot. *pale-whitish-brown* or *albido-cinerascent*, thin, smooth, effuse; *apothecia* black, *minute*, *sub innato-sessile*, *hemispherico-conoid*; *perithecium dimidiate*, black; *epitheciun* a depressed pore; *paraphyses indistinct*; *spores* 8, *fuscous*, oblong, 1-septate, constricted; *gelatina hymenea* brownish with iodine.

On trees, rare. 1864.

SYN :—Flot. in Zw. Exs. Nyl. Scand. 281. Carroll in Seem. Journ. Bot. vol. 3. 293.

FIG :—Hepp Sporen t. 13. f. 108.

EXS :—Zw. 37. 217. 110. Anzi Ital. S. 381. Hepp 108.

GEOG. DISTRIB :—Germany, Italy, Switzerland, France, Lapland, Amazons.

BOT. PROV :—2...19.

ENGLAND :—New Forest, Hants. *Rev. J. M. Crombie*.

IRELAND :—Glengariff, Cork; Glencar; Loch Inchiquin ! Kerry; Dinis, Killarney; Glenbower Wood, Killeagh; Eagle's Nest. *Mr. Carroll*. (1864).

Var. *megaspora*, Nyl. spores double the size of those of the type.

On trees, rare. 1868.

SYN :—Nyl. in Flora 1868. p. 348. Crombie En. 121.

GEOG. DISTRIB :—France.

BOT. PROV :—2.

ENGLAND :—Near Lyndhurst, ! New Forest, Hants. *Rev. J. M. Crombie*. (1868).

\*\* *Perithecium entire.*

45. *V. Taylora*, Carroll. *olivaceo-fuscescent*, thin, continuous or rimulose, rugulose, macular; *apothecia* black, minute and very numerous, semi-immersed, *acutely conical*, internally pale; *epithecium papillate*, poriform; *perithecium entire*, black; *paraphyses* distinct, slender; *spores* 8, colourless, *fusiform*, 1-septate, constricted, the cells very acute at the apices, with 2 or 3 nuclei, and having a tendency to break up or separate; *gelatina hymenea* yellow with iodine, the spores brown.

On ash trees, rare. 1856.

SYN:—Nyl. Pyren. 82. (1858.) *Arthopyrenia*. Mudd Man. 302.

EXS:—Anzi Venet. 137.

GEOG. DISTRIB:—Dalmatia, Austria.

BOT. PROV:—19.. 25.

IRELAND:—Dunscombe's Wood! Cork; Clare Glen, Tipperary!  
*Mr. Carroll.* (1856).

46. *V. bryospila*, Nyl. fuscous-black, thin, opaque; *apothecia* black, prominent, sub-conical; *epithecium* impressed; *perithecium entire*, black; *paraphyses* slender; *spores* 8, 4 or 2, colourless, oblongo-ovoid, 1-septate; *gelatina hymenea* untinged with iodine.

On schistose earth, very rare. 1864.

SYN:—Nyl. in Flora 1864. p. 257.

GEOG. DISTRIB:—Norway.

BOT. PROV:—15.

SCOTLAND:—Ben Lawers. *Mr. Carroll.* (1864).

47. *V. capnodes*, Nyl. dull-black, tinged with grey or olive, roughish, macular, filmy, continuous; *apothecia* black, concolorous, roughish, encrusted by the thallus, minute, prominent, hemispherical, internally greyish; *epithecium* slightly papillose or umbilicate, poriform; *perithecium entire*, black; *spores* 8, colourless, linear-oblong, 1-septate, small.

On trees, rare. 1829.

SYN:—Nyl. in Flora 1867. p. 330. *V. rhyponia*, Leight. Ang. Lich. 37.

FIG:—E. Bot. Suppl. t. 2597. fig. 2. Leight. Ang. Lich. t. 16. fig. 1.

GEOG. DISTRIB:—Europe.

BOT. PROV:—2...10...19.

ENGLAND:—New Forest, Hants. *Mr. Lyell.* (1829.) Sussex!

*Mr. Borrer.* Malham. *Dr. Carrington.* Hoggarts Wood and Easby Wood, Cleveland. *Mr. Mudd.*

IRELAND:—Castlebernard Park, Bandon. *Mr. Carroll.*

Var. *rhyPontella*, Nyl. spores 1-septate, smaller.

On trees, very rare.

SYN :—Nyl in Flora 1867. p. 374.

EXS :—Fries 253.

GEOG. DISTRIB :—Europe.

BOT. PROV :—19.

IRELAND:—Glenbower Wood, co. Cork. *Mr. Carroll.*

48. *V. biformis*, Borr. *whitish or albido-cinerascent*, thin, contiguous or rimulose, slightly rugose or smooth, somewhat pulverulent, indeterminate; *apothecia* black or brownish-black, small, numerous, *semi-immersed*, prominent, internally pale; *ostium* *hemispherical*, dull or polished, rugulose; *epithecium* *poriform*, minute, impressed, *ultimately lacero-dehiscent*; *perithecium* thickish, black, *entire*; paraphyses very long, slender, distinct; spores 8, colourless, linear-ellipsoid, 1-septate, cells with one or two nuclei; gelatina hymenea red with iodine.

On trees, common. 1829.

SYN :—Borr. in E. Bot. Suppl. 2617. (1829.) Leight. Ang. Lich. 37. Nyl. Pyren. 54.

FIG :—E. Bot. Suppl. t. 2617. f. 1. Leight. Ang. Lich. t. 16. f. 2. & 3.

EXS :—Leight. 100. Zw. 36. Nyl. 91. Mudd 286. Hepp 953.

GEOG. DISTRIB :—France, Germany, Switzerland, America.

BOT. PROV :—1, 2, 3, 4...7, 8 ..10...19...31.

ENGLAND :—Sussex! *Mr. Borrer.* Torquay! Devon, *Dr. Deakin.* Gopsall! Leicestershire. *Rev. A. Bloxam.* Yoxall! Staffordshire. *Prof. Ch. Babington.* Malvern. *Mr. Lees.* Airyholme Wood! Ayton! Cleveland. *Mr. Mudd.* Clayton near Brighton. *Mr. Larbalestier.* Stoke Wood, Exeter. *Mr. Parfitt.* Kelvedon; Witham, Essex. *Mr. Varenne.* New Forest. *Rev. J. M. Crombie.* Shelton Rough! Weir Coppice! near Shrewsbury; Haughmond Hill! Loppington!! Shropshire.

IRELAND :—Ardtully! co. Kerry. *Dr. Taylor.*

WALES :—Barmouth!

CHANNEL ISLANDS :—Jersey and Guernsey. *Mr. Larbalestier.*

49. *V. Salweii*, Leight. *whitish or greyish-white*, thin, tartareo-farinose, nearly evanescent; *apothecia* black, *very large and prominent*, hemispherico-conical, *sessile*; *ostium* rugulose; *epithecium* *very large and open*; *perithecium* *entire*; paraphyses distinct, long, slender, floccenlose; asci linear; spores 8, colourless, broadly

and obtusely oblong, 1-septate, in size and form similar to those of *V. gemmata*.

On calcareous rocks, mortar, &c. not common. 1851.

SYN :—*V. Salweii*, Leight. in litt. 1851. Nyl. Prodr. 189. Mudd Man. 296.

GEOG. DISTRIB :—France.

BOT. PROV :—2...5...7...19.

ENGLAND :—Llanforda ! near Oswestry, Shropshire. (1851). Shanklin Church ; ! Sandown ! Isle of Wight. *Rev. T. Salwey*. Malvern. *Mr. Lees*.

IRELAND :—Riverstown ! Cork. *Mr. Carroll*,

WALES :—Harlech Castle ! *Rev. T. Salwey*.

50. *V. litoralis*, Tayl. *pale-greenish-grey*, thin, tartareous, continuous ; *apothecia* black and shining, numerous, crowded, sessile, the base only immersed in very slightly elevated portions of the thallus, *very prominent, sub-globose, truncato-conical* ; *epithecium* large, depressed, *umbilicate* ; *perithecium* thick, *entire* ; paraphyses distinct ; spores 8, colourless, oblong, 1-septate.

On maritime rocks, rare.

SYN :—*V. muralis* var. Tayl. Fl. Hib. 2. 92. (1836.) *V. litoralis*, Leight. Ang. Lich. 46.

FIG :—Leight. Ang. Lich. t. 20. f. 2.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1...7...19.. 30, 31.

ENGLAND :—Mudstone, Devon. *Dr. Holl*.

IRELAND :—Kerry ! Dunkerron ! *Dr. Taylor*. (1836.) Glenarm, Antrim. *Adm. Jones*. Sunday's Well Weirs and Ballinhassy, Cork. *Mr. Carroll*.

WALES :—Aber-Ty-Gwyn near Dolgelley ; Aberhamfre, Barmouth. *Rev. T. Salwey*.

CHANNEL ISLANDS :—St. Aubins Fort, Jersey. *Mr. Larbalestier*.

51. *V. rugulosa*, (Borr.) *apothecia* small, crowded, *prominent, semi-immersed, hemispherico-conical*, brownish-black ; *epithecium* round, simple ; *perithecium* entire ; spores 8, dark-brown, oblong, 1-septate, minute.

On old walls, rare. 1850.

SYN :—*Verrucaria*, Leight. Ang. Lich. 47. (1851.) *Endococcus*, Nyl. Prodr. 193.

FIG :—Leight. Ang. Lich. t. 21. f. 1.

EXS :—Arn. 250.

GEOG. DISTRIB :—Pyrenees, Bavaria.

BOT. PROV :—1, 2...7.

ENGLAND :—Near Lewes ! Sussex. *Mr. Borrer*. (1850.) Star Cross, Devon. *Mr. Parfitt*.

WALES :—Barmouth !



C. *Spores 3-septate.*

\* *Perithecium dimidiate.*

52. *V. rhyponia*, Ach. *fusco-nigrescent or fuliginous*, very thin, opaque, *macular*, sub-effuse; apothecia minute, sessile, hemispherical; *perithecium dimidiate*, black; *epithecium* a minute pore; paraphyses none; *spores* 8, colourless, lineari-oblong, 3-septate, minute; *gelatina hymenea* red or yellow-brown with iodine.

On smooth barks of poplar, alder, &c. rare.

SYN:—Ach. L. U. 282. (1810.) Syn. 89. Nyl. Scand. 281. *V. fumago*, Wallr. Cr. Germ. 1. 298.

EXS:—Zw. 368 34. Arn. 241. Anzi Venet. 121. 122. M. & N. 557. Schær. 591. 645. Leight. 254. Mudd 291.

GEOG. DISTRIB:—Germany, France, Switzerland, Italy, Sweden.

ENGLAND:—Near Ayton! Cleveland. Mr. Mudd.

SCOTLAND:—Killin. Rev. J. M. Crombie.

IRELAND:—Dunkerron. Dr. Taylor. Deer Park, Glenarm. Adm. Jones.

53. *V. Cerasi*, Ach. *pale-yellow, fuscous or fuscous*, thin, membranous, more or less shining, *maculari-determinate*; apothecia very numerous and crowded, minute, oblong or rounded, convex, shining; *perithecium* dimidiate, fuscous-black; paraphyses none; *spores* 8, colourless, lineari-oblong, 3-septate.

On young oaks, not common. 1871.

SYN:—Ach. L. U. 276. (1810.) Syn. 89. Nyl. Scand. 281. Leight. Ang. Lich. 41.

EXS:—Zw. 106. Schær. 644.

GEOG. DISTRIB:—Germany, Italy, Pyrenees, Hungary, Liguria, Switzerland, Scandinavia.

BOT. PROV:—7.

WALES:—Wood opposite Tanybwllch Hotel, Capel Curig!; Wood Glyn near Capel Curig! (1871).

54. *V. linearis*, Leight. *greyish-white*, thin, tartareous, effuse; apothecia very minute, black, *hemispherical*, slightly immersed, internally pale; *perithecium* very thick, dimidiate, incurved at the base, inner tunic pale; *epithecium* depressed, *umbilicate*; paraphyses distinct; *spores* 8, colourless, *linear*, rounded at the extremities, 3-septate.

On calcareous rocks, rare.

SYN:—Leight. Ang. Lich. 52. (1851).



FIG:—E. Bot. Suppl. t. 2791. small *Verrucaria* in fig. 1. Leight. Ang. Lich. t. 23. f. 1.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1.

ENGLAND:—Chedder! *Mr. Borrer*.

55. *V. pyrenophora*, Ach. mouse-coloured, very thin, tartareous, continuous or rimulose, effuse, determinate; apothecia black, large, very prominent, sessile, conoideo-sub-truncate, internally pale; perithecium dimidiate; epithecium depressed, umbilicate; paraphyses none; spores 8, colourless, broadly linear-oblong, 3-septate; gelatina hymenea vinous-red with iodine.

On alpine rocks, rare.

SYN:—Ach. L. U. 285. (1810.) Syn, 94. Leight. Ang. Lich. 76. and 54.

FIG:—Leight. Ang. Lich. t. 23. fig. 4. 5. 6.

EXS:—Leight. 139. Arn. 131. Hepp 97. 98. Anzi Langob. 286.

GEOG. DISTRIB:—Switzerland, Sweden, Pyrenees, Austria, Hungary.

BOT. PROV:—1...7...11, 12...15...19...24...26.. 28.

ENGLAND:—Nent Force! Cumberland. *Mr. Robertson*. Hartlepool, Durham. *Mr. Mudd*. Starcross, Devon. *Mr. Parfitt*, Craigforda, Shropshire.

SCOTLAND:—Ben Lawers and Craig Guie. *Rev. J. M. Crombie*.

IRELAND:—Barnaghee Mountain! *Dr. Taylor*. Armagh. *Adm. Jones*. Rosscarberry, Cork; Dromoland, Clare; Ballaghbeama Gap! Kerry. *Mr. Carroll*.

WALES:—Llyn Aran! Cader Idris.

56. *V. microcarpa*, Dav. whitish, farinose or evanescent; apothecia black, very minute, solitary or congregated, hemispherical, sessile; perithecium dimidiate, black; epithecium poriform; paraphyses none; spores 8, colourless, broadly elliptico-oblong, 3-septate,  $\frac{2}{3}$  less than those of *pyrenophora*; gelatina hymenea vinous-red with iodine.

On chalk, rare.

SYN:—G. Davies MS. in Herb. Borrer.

GEOG. DISTRIB:—Europe.

BOT. PROV:—2.

ENGLAND:—Horton Downs! Sussex. *Mr. Davies*.

57. *V. rubella*, Nyl. thallus none; apothecia pale-reddish or rufescent, tuberculoso-spherical, prominent; perithecium dimidiate, colourless in lower portion; spores 100 or more, colourless, ellipsoid, 3-septate; paraphyses slender, elongate; filamenta ostiolaria distinct; gelatina

hymenea vinous-red with iodine.

On trees, rare. 1866.

SYN :—*Thelopsis*, Nyl. Prodr. 196 (1857.) Crombie En. 123.

FIG :—Hepp Sporen. t. 80. f. 707.

EXS :—Nyl 98. Hepp 707. Zw. 50. Arn. 251.

GEOG. DISTRIB :—France, Germany.

BOT. PROV :—15...19.

SCOTLAND :—Lanrick Castle ! near Doune, Perthshire. *Dr. A. Mc Kinlay*. (1866).

IRELAND :—Dinis Island, Killarney. *Mr. Carroll*.

58. *V. lectissima*, (Frs.) *pale-olive* or cinereous-olive or rufous, thin, continuous or rimulose, sub-tartareous, effuse ; *apothecia pale-rufous or rufescent*, immersed in prominent thalline verrucæ, hemispherical, papillose ; ostiolum more or less denuded ; epithecium a rather large depressed pore ; *perithecium dimidiate, rufous* ; spores 8, colourless, fusiform, 3-septate ; paraphyses distinct, slender ; gelatina hymenea untinged with iodine.

On moist sub-alpine rocks, not frequent. 1836.

SYN :—*Segestrella*, Fries L. E. 430. (1831.) Nyl. Scand. 278. *V. irrigua & erysiboda*, Tayl. Leight. Ang. Lich. 56.

FIG :—Leight. Ang. Lich. t. 24. f. 4. & 6.

EXS :—Leight. 32. Anzi It. S. 394. Zw. 23. Larbal. 49. Schær. 285. Hepp 696.

GEOG. DISTRIB :—Pyrenees, Germany, Switzerland, Italy.

BOT. PROV :—1...7...16 . 18, 19.. 22...31.

ENGLAND :—Penzance ! Cornwall. *Rev. T. Salwey*.

SCOTLAND :—Appin and Lerwick in Shetland. *Rev. J. M. Crombie*.

IRELAND :—Dargle river ! co. Wicklow ; Carig Mountain ! ; Blackwater Bridge co. Kerry. *Dr. Taylor*. (1836.) Turk Mountain ; and Ballaghbeama Gap, Kerry. *Mr. Carroll*.

WALES :—Arddog ! Rhaidyr Mowddach ! *Rev. T. Salwey*. Fridd-du ! Aber Valley ; Llyn Aran ! and Llyn Cae ! Cader Idris ; Cell Fawr ! Barmouth ; Cwm Cywion ! Glyder Vach ; Llyn Cwlyd !

CHANNEL ISLANDS :—Rozel Valley ! Noirmont ! Jersey. *Mr. Larbalestier*.

Var. *leptalea*, (DR. & Mnt.) “apotheciis rufis, admixtis aliis infuscatis.”

On trees, rare. 1864.

SYN :—*Biatora leptalea*, D. R. & Mont. Fl. Alger. 1. p. 268. (1846.) Mnt. Syll. 339. Nyl. Prodr. 187. Pyr. 38.

GEOG. DISTRIB :—Algeria, Aland, Norway.

BOT. PROV :—2.. 7...19.. 26...27.

ENGLAND :—New Forest ! *Rev. J. M. Crombie*.

WALES :—Wood opposite Tanybwch Hotel, Capel Curig !

IRELAND:—Curraghmore. *Adm. Jones*. (1864.) Crosshaven, Cork; Killarney; Glenbower, Killeagh. *Mr. Carroll*.

59. *V. chlorotica*, (Ach.) *olivaceo-fuscescent* or *cine-rascent*, thin, *continuous, smooth, somewhat varnished or mucoso-gelatinous*; *apothecia black*, minute, sessile, sub-hemispherical, *convex, polished* and shining, *internally pale*; *perithecium dimidiate*; *epithecium* a minute depressed pore; paraphyses distinct; spores 8, colourless, fusiform, 3-septate; *gelatina hymenea* yellow or untinged by iodine.

On rocks and trees, frequent.

SYN:—Ach. Syn. 94. (1817.) Nyl. Pyren. 36. Scand. 277.

EXS:—Zw. 152. 153. Mudd 288. Leight. 138.

GEOG. DISTRIB:—Germany, Italy, Scandinavia, America, Polynesia.

BOT. PROV:—7...10...31.

ENGLAND:—Near Ayton!; Ingleby!; Cleveland. *Mr. Mudd*.

WALES:—Between Corwen and Bala! Festiniog road! near Dolgelly.

CHANNEL ISLANDS:—The Warren! Noirmont, Jersey; Jerbourg! Guernsey. *Mr. Larbalestier*.

forma *trachona*, (Tayl.) olive-green or cinereous, tartareous, thin, continuous or rimulose; sometimes subpulverulent; *apothecia internally nigro-fuscous*.

On sandstone rocks, frequent.

SYN:—Tayl. Fl. Hib. 2. 93. (1836.) Leight. Ang. Lich. 50.

FIG:—Leight. Ang. Lich. t. 22. f. 1. 2.

EXS:—Arn. 17. Mass. 348. Hepp 695.

GEOG. DISTRIB:—Bavaria, France, Pyrenees.

BOT. PROV:—1...8...19.

ENGLAND:—Torquay! *Dr. Deakin*, near Buxton! *Dr. Holl*. Batheaston! *Mr. Broome*. Penzance! *Rev. T. Salwey*.

IRELAND:—Derriquin! Askew Wood! *Dr. Taylor*.

forma *subintegra*, Nyl. *pale-cinereo-virescent*, thin, *tartareous, rimulose*, indeterminate; *apothecia moderate*, somewhat convex and prominent, internally pale; *perithecium dimidiate*, much incurved at the base; spores 8, colourless, fusiform, 3-septate.

On granitic maritime rocks, rare.

SYN:—*V. subintegra*, Nyl. in Flora 1865. p. 212.

GEOG. DISTRIB:—Europe.

BOT. PROV:—31.

CHANNEL ISLANDS:—Rozel; Noirmont; La Coupe! Jersey, *Mr. Larbalestier*.

forma *carpineae*, Schaer. *dark-opake-olive-green or brown*, thin, continuous, effuse; *apothecia* minute, black, polished and shining, sessile, internally pale; perithecium dimidiate; spores 8, colourless, fusiform, 3-septate.

On trees, frequent.

SYN:—Schaer. Spicil. 342. (1833.) *V. fusiformis*, Leight. Ang. Lich. 42. (1851.) Mudd Man. 301.

FIG:—Leight. Ang. Lich. t. 18. f. 2.

EXS:—Leight. 99. Mudd 289. Zw. 39. B. D. 40. 42. 43. Arn. 181. 242. M. & N. 855. Schaer. 525. Bohl. 82. Rabh. 759. Nyl. 96.

GEOG. DISTRIB:—Germany, Bavaria, Switzerland, Sweden, France, Pyrenees.

BOT. PROV:—4, 2, 3...5 ..7...8...10...19...28...31.

ENGLAND:—Sowerdale! Airyholme Wood! Newton Wood! Cliff-rigg! Cleveland. *Mr. Mudd*. Yoxall! *Rev. Prof. Ch. Babington*. Red hills, Exeter. *Mr. Parfitt*. Colne Engaine, Essex. *Mr. Varenne*. Sussex! *Mr. Borrer*. Shelton Rough! near Shrewsbury.

IRELAND:—Castlebernard Park! Bandon; Douglas near Cork; Dunscombe's Wood. *Mr. Carroll*. Armagh Demesne. *Adm. Jones*.

WALES:—Barmouth!; Gloddaeth! Carnarvonshire.

CHANNEL ISLANDS:—Belouste Bay, Jersey. *Mr. Larbalestier*.

Var. *codonoidea*, Leight. *virescenti-olivaceous*, thin, tartareous, rimulose; *apothecia* minute, black, polished, hemispherical, depresso-conical, papillate; perithecium thin, dimidiate, inner tunic black, internally pale; paraphyses distinct; spores linear, narrowed and rounded at each extremity, colorless, 3-septate.

On rocks, rare. 1850.

SYN:—Leight. Ang. Lich. 53. (1850).

FIG:—Leight. Ang. Lich. t. 23. f. 3.

GEOG. DISTRIB:—Italy.

BOT. PROV:—2 ..5...8...10.

ENGLAND:—Isle of Wight! *Rev. T. Salway*. Langbraugh-rigg near Ayton. *Mr. Mudd*. Charnwood Forest! Leicestershire. *Rev. Prof. Ch. Babington*. Haughmond Hill! (1850.) Craig-y-Rhiw! Oswestry.

WALES:—Craig Breidden!

\*\* *Perithecium entire*.

§ *Spores colourless*.

60. *V. incavata*, Nyl. *greyish-white*, thin, tartareo-farinose, contiguous, smooth, sub-determinate; *apothecia* black, deeply immersed in the thallus and rock beneath, hemispherico-globose; *perithecium entire*; *epithecium* depressed with a large pore; paraphyses none; spores 8,

colourless, *elliptico-oblong* or *oblong*, 3 *septate*, *constricted*.

On calcareous rocks, rare. 1859.

Resembling *V. immersa* in its habit and general external aspect.

SYN:—*Thelidium*, Mudd Man. 295. (1861).

FIG:—Mudd Man. t. 5. f. 122.

EXS:—Mudd 282.

GEOG. DISTRIB:—Europe.

BOT. PROV:—10, 11.

ENGLAND:—Ingleborough. *Dr. Carrington*. Bilsdale, Yorkshire; Castle Eden Dean, Durham. *Mr. Mudd*.

61. *V. marina*, (Deak.) *dark-greenish-black*, *sub-gelatinous*, *smooth*, *continuous*, *effuse*, *nigro-limitate*; *apothecia* *black*, *immersed in the thallus*, *excessively minute* and *numerous*; *ostiolum* *slightly elevated*; *epithecium* *large*, *impressed*, *umbilicate*; *perithecium* *entire*, *black*, *thin*; *paraphyses* *none*; *spores* 8, *colourless*, *lineari-oblong*, 1- or 3-*septate*, *very minute*; *gelatina hymenea* *rubruscent* with *iodine*.

On submerged maritime rocks, rare. 1854.

SYN:—*Sagedia*, Deakin in Ann. and Mag. Nat. Hist. ser. 2. vol. 13. p. 40. (1854).

FIG:—Ann. and Mag. Nat. Hist. 1. c. t. 4. f. 13.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1.

ENGLAND:—Meadfoot; near Torquay, Devon. *Dr. Deakin*. (1854.)

62. *V. dubiella*, Nyl. *cinerascent*, *cartilaginous*, *granulato-unequal*, *sub-crenate* ( “ *an proprius* ” ? ); *apothecia* *black*, *small*; *perithecium* *entire*, *black*; *paraphyses* *none*; *spores* 8, *colourless*, *oblong* or *ovoideo-oblong*, 3-*septate*, *small*; *gelatina hymenea* *vinous-red* with *iodine*.

On mosses amongst mountains, probably parasitic, rare. 1864.

SYN:—Nyl. in Flora 1865. p. 356. Carroll in Seem. Journ. Bot. 4. 25.

GEOG. DISTRIB:—Europe.

BOT. PROV:—15.

SCOTLAND:—Loch-na-Cat, north side of Ben Lawers. *Mr. Carroll*. (1864).

63. *V. epigaeoides*, Nyl. *pallido-virescent*, *macular*; *apothecia* *black*, *chiefly immersed*; *perithecium* *black* in the upper portion, *fuscescent* in the immersed part;



paraphyses slender; spores 8, colourless, oblong, 3-septate.

On the earth in sub-alpine localities, rare. 1865.

Similar to *V. epigæa*, but smaller.

SYN:—Nyl. in Flora 1867. p. 329. Carroll in Seem. Journ. Bot. 5. 259.

GEOG. DISTRIBUTION:—Europe.

BOT. PROV:—24.

IRELAND:—Cliffs of Moher co. Claro. *Mr. Carroll*. (1865).

64. *V. melathelia*, (Nyl.) thallus scarcely any, chroolepoid; apothecia black, tuberculose, prominent, rugoso-irregular; epithecium not always distinct; perithecium ellipsoid, nigricant or rufescent, entire; spores innumerable, ellipsoid or oblong, indistinctly 3-septate; paraphyses slender; filamenta ostiolaria slender; gelatina hymenea blue then dark-violet with iodine.

On mosses amongst alpine schistose rocks, rare. 1864.

SYN:—*Thelopsis*, Nyl. in Flora 1864. p. 258. Carroll in Seem. Journ. Bot. 3. 293.

GEOG. DISTRIBUTION:—Europe.

BOT. PROV:—15.

SCOTLAND:—Summit of Ben Lawers. *Adm. Jones*. (1864); Craig Calliach, Breadalbane. *Rev. J. M. Crombie*.

### §§ Spores fuscous.

65. *V. nitida*, (Weig.) pale-yellow or olive or olive-brown, waxy, continuous, smooth, more or less polished, with scattered whitish minute protuberances; apothecia black, large, immersed in, or invested by the thallus, hemispherico-globose; ostiolum black, more or less denuded; perithecium entire, black; epithecium large, depressed, umbilicate; paraphyses distinct; spores 8, brown, elliptical or oblong, slightly tapering towards each apex, 3-septate, cells angulari-nucleolate; gelatina hymenea untinged by iodine.

On trees, frequent. 1783.

SYN:—*Sphæria*, Weigel, Obs. p. 45. (1772.) *Verrucaria*, Schrad. Journ. 1801. 1. p. 79. Ach. L. U. 279. Nyl. Pyren. 45. Scand. 279.

FIG:—E. Bot. Suppl. t. 2607. f. 1. Leight. Ang. Lieh. t. 15. f. 3. Tul. Mem. t. 2. f. 6. 8.

EXS:—Schær. 111. Boid. 166. Zw. 30. Leight. 27. Larbal. 48. Anzi Ital. S. 391. M. & N. 365. Welw. Lusit. 55.

GEOG. DISTRIBUTION:—Switzerland, Germany, Italy, Portugal, Pyrenees, Sweden, Hungary, Himalaya, N. Zealand, Cuba.

BOT. PROV:—1, 2, 3, 4, 5...7, 8...10, 11...14, 15, 16...30, 31.

ENGLAND:—Oswestry! Shropshire. *Rev. T. Salwey*. Gopsal! Leicestershire. *Rev. A. Bloxam*. New Forest! Hants. *Mr. Lyell*. Epping Forest. *Rev. J. M. Crombie*. Torquay! Devon. *Dr. Deakin*. Helks Wood, Ingleborough. *Dr. Carrington*. Clifton near Bristol. *Miss Atwood*. Castle Eden Dean, Durham; Bilsdale, York. shire; Kildale, Cleveland. *Mr. Mudd*. Budleigh Salterton, Devon. *Dr. Dickie*. Kelvedon, Essex. *Mr. Varenne*. Midland Counties. *Mr. Purton*. Pophills, Warwickshire. *Rev. W. S. Rufford*. Oxford. *Mr. Baxter*. Cambridgeshire. *Rev. R. Relhan*. Plymouth. *Mr. Holmes*.

SCOTLAND:—Auchindenny Wood. *Dr. Greville*. Lochaber; Appin. *Rev. J. M. Crombie*.

IRELAND:—Redhall! co. Antrim. *Mr. Thompson*. Ardglass co. Down. *Dr. Maingay*.

WALES:—Near Harlech! *Mr. T. Brittain*. Gloddaeth! near Conway; near Dolgelley!

CHANNEL ISLANDS:—Jersey! Guernsey; Sark. *Mr. LARBALÉSTIER*.

Var. *nitidella*, Flk. pale-yellow, very thin; apothecia one half the size of those of *nitida*.

On trees, frequent.

SYN:—Flk. D. L. 10. (1821.) Nyl. Pyr. 45. Scand. 279.

EXS:—Zw. 30. B. 32. Welw. Lusit. 29. Leight. 28. Larbal. 99. Anzi Ital. S. 392. Hepp 958.

GEOG. DISTRIB:—Germany, Portugal, Italy, Switzerland, Belgium, Cuba, Ceylon.

BOT. PROV:—1... 7...10...(19—30). 31.'

ENGLAND:—Torquay! Devon. *Dr. Deakin*. Kildale! Cleveland. *Mr. Mudd*. Haldon, Exeter. *Mr. Parfitt*, near Lyndhurst, New Forest. *Rev. J. M. Crombie*.

IRELAND:—On trees, frequent. *Mr. Carroll*.

WALES:—Gloddaeth! near Conway.

CHANNEL ISLANDS.—Guernsey; Sark; Rozel, St. Peter's and St. Lawrence, Jersey! *Mr. LARBALÉSTIER*.

66. *V. glabrata*, Ach. whitish, pale-yellow or greyish, thin, membranaceous, opaque; apothecia black, moderate, semi-immersed, hemispherico-conoid; ostiolum denuded; peritheecium entire, black; epithecium a minute pore; paraphyses distinct; spores 8, fuscous, ellipsoid, 3-septate or 4-locular, smaller than in *nitida*; gelatinahy-menea yellowish with iodine.

On smooth barks, rare.

SYN:—Ach. Syn. 91. (1867.) Nyl. Pyren. 47. Prod. 128.

EXS:—Hepp Sporen t. 25. f. 227.

EXS:—Schær, 110. M. & N. 950. Zw. 84.

GEOG. DISTRIB:—Switzerland, Germany, France, Italy, Hungary, N. America, New Zealand.

BOT. PROV.—19.

IRELAND:—Glengarriff; Lough Inchiquin; Glencar co. Kerry; Killarney. *Mr. Carroll.*

Var. *dermatodes*, Borr. cream-coloured, very thin, determinate; apothecia half the size of those of *glabrata*.

On smooth barks, rare.

SYN:—Borr. in E. Bot. Suppl. 2607. (1829.) Tayl. Fl. Hib. 2. 87. Leight. Ang. Lich. 36. *V. glabratula*, Nyl. in Flora 1867. p. 330. *V. achroopora* Nyl. in Flora 1867. p. 179.

FIG:—E. Bot. Suppl. t. 2607. f. 2. Leight. Ang. Lich. t. 15. f. 4.

GEOG. DISTRIB:—New Zealand.

BOT. PROV:—1...3...19.

ENGLAND:—Red Hills, Exeter. *Mr. Parfitt.* Rivenhall, Essex. *Mr. Varenne.*

IRELAND:—Near Bantry! *Miss Hutchins.* (1829.) near Killarney. *Sir T. Gage.* Askew Wood near Sneem. *Dr. Taylor.*

67. *V. peripherica*, (Tayl.) apothecia small, prominent, semi-immersed, conoid, black; perithecium entire; spores 8, fuscous, constricted in the middle, formed of 2 short obtuse cones set base to base, each cell septate.

On mountain rocks, rare. 1836.

SYN:—*Verrucaria*, Tayl. Fl. Hib. 2. 97. (1836.) Leight. Ang. Lich. 48.

FIG:—Leight. Ang. Lich. t. 21. f. 2.

GEOG. DISTRIB:—Europe.

BOT. PROV:—7...19.

IRELAND:—Carig Mountain! co. Kerry. *Dr. Taylor.* (1836.)

WALES:—Barmouth! *Rev. T. Salwey.*

### D. Spores 3-5-septate.

#### \* *Perithecium dimidiate.*

68. *V. albissima*, (Ach.) creamy-white, very thin, membranous, effuse, smooth; apothecia black, elliptical, hemispherico-conoid, sessile; perithecium dimidiate, black; epithecium poriform; paraphyses indistinct; spores 8, colourless, acicular, more or less curved, 3 or 5-septate.

On birches &c. rare. 1850.

SYN:—Nyl. Scand. 282. (1861.) *V. epidermidis* var. *albissima*, Ach. L. U. 276. (1810.) Syn. 89. *V. oenyspora*, Nyl. Pyr. 61.

EXS:—Nyl. 149. Mudd 299. Fellm. 223. Schær. 107. 108.

GEOG. DISTRIB:—Sweden, Austria, Hungary, France, Switzerland, E. Lapland.

BOT. PROV.—3...5...7...10...19.

ENGLAND:—Hoggarts Wood!; Ingleby; Baysdale; and near Ayton; Cleveland. *Mr. Mudl.* Pod's Wood, Messing, Essex. *Mr. Varenne.* Alberbury! Shropshire. (1850).

SCOTLAND:—Castleton of Braemar. *Rev. J. M. Crombie.*

IRELAND:—Killarney; Little Island, Cork. *Mr. Carroll.*

WALES:—Dolgelley!

69. *V. platypyrenia*, Nyl. effuse; *apothecia plane*, at first *hypophloeodal*, opaque; paraphyses soft, irregular or indistinct; spores colourless or in age fuscous, oblong, 3-5-septate.

On trees, rare; 1865.

SYN:—Nyl. in Flora 1865. p. 358. Carroll in Seem. Journ. Bot. 4. 25.

GEOG. DISTRIB:—Europe.

BOT. PROV:—19.

IRELAND:—Ballyedmond co. Cork; Old Dromore, Kerry; Glenbower, Killeagh. *Mr. Carroll.* (1865).

**\*\* *Perithecium entire.***

70. *V. furvescens*, Nyl. *fuscous* or olivaceo-fuscous, *granulato-unequal*, thin, opaque, effuse, not continuous; *apothecia innate*, moderate, the *conical apex emersed*; *perithecium entire*, black; paraphyses slender, crowded; spores 8, colourless, fusiform, 3-5-septate.

On minute mosses on schistose earth in alpine localities, very rare. 1864.

SYN:—Nyl. in Flora 1864. p. 256. Carroll in Seem. Journ. Bot. 3. 293.

GEOG. DISTRIB:—Europe.

BOT. PROV:—15.

SCOTLAND:—Summit of Ben Lawers. *Adm. Jones.* (1864).

71. *V. desistens*, Nyl. *evanescent*; *apothecia minute*; *perithecium entire*, upper portion *convex*, fusiform, prominent; paraphyses none; spores 8, colourless, fusiform, 3-5-septate, straight; *gelatina hymenea* vinous-red with iodine.

On old trees, very rare. 1867.

SYN:—Nyl. in Flora 1867. p. 180. Carroll in Seem. Journ. Bot. 5. 260.

GEOG. DISTRIB:—Europe.

BOT. PROV:—19.

IRELAND:—Turk Mountain, Killarney. *Mr. Carroll.* (1867).

**E. Spores 5-septate.**

72. *V. perminuta*, Deak. *dark-olive-green*, thin, *con-*

*tinuous, uneven, rugose and warty, indeterminate; apothecia brownish-black, scattered or confluent, minute, prominent, hemispherico-globose, internally pale; perithecium dimidiate, incurved at the base; inner tunic thin, black; epithecium a minute pore; spores 8, colourless, fusiform, 5-septate.*

On maritime rocks, rare. 1854.

Closely allied to *V. chlorotica* var. *trachona*, Tayl.

SYN :—Deakin in Ann. and Mag. Nat. Hist. ser. 2. vol. 13. p. 32.

FIG :—Ann. and Mag. Nat. Hist. 1. c. t. 2. f. 6.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1.

ENGLAND :—Torquay ! Devon. *Dr. Deakin*. (1854.) Penzance, Cornwall. *Rev. T. Salwey*.

73. *V. horistica*, Leight. *rufous or rufo-ferruginous*, thin, sub-tartareous, smoothish, *with numerous dirty pale-whitish-yellow soredia, limited by conspicuous elevated thickish nigro-fuscous lines* resulting from the confluence of the hypothallus of many adjacent thalli; *apothecia nigro-fuscous or black*, scattered, few, hemispherical, depressed, umbilicate, sessile; perithecium nigro-fuscous, dimidiate; paraphyses distinct; spores 8, colourless, narrowly or attenuato-fusiform, 5-septate.

On shaded shaly mountain rocks, not common. 1871.

GEOG. DISTRIB :—Europe,

BOT. PROV :—7.

WALES :—Wood opposite Tanybwlech Hotel, Capel Curig !; Llyn Cwlyd ! (1871).

### F. Spores 7-septate.

#### \* *Perithecium dimidiate.*

74. *V. lucens*, Tayl. *olivaceo-fuscescent or cinereo-fuscescent*, thin, tartareous, minutely rimulose or continuous, *nigro-limitate*; *apothecia black, prominent, shining, conico-hemispherical, solitary or clustered, internally pale; perithecium dimidiate, black, thick, inner tunic pale-brown; epithecium depressed, umbilicate; paraphyses very slender, filiform, numerous; spores 8, colourless, broadly elongato fusiform, 7-septate, at least 4 times the size of those of V. chlorotica.*

On siliceous slate and basalt, rare. 1836.

SYN :—Tayl. Fl. Hib. 2. 257. (1836.) Leight. Ang. Lich. 55.



FIG :—Leight. Ang. Lich. t. 24. f. 2.

GEOG. DISTRIB :—Europe.

BOT. PROV :—19.

IRELAND :—Lough Finnehy ; Blackwater Bridge ! co. Kerry. *Dr. Taylor*. Croghane ; Killarney. *Mr. Carroll*.

75. *V. lactea*, Körb. cream-coloured, thin, effuse ; *apothecia* black, minute, *sub-innato-sessile*, hemispherical ; *perithecium* *dimidiate*, incurved at the base, black ; *epithecium* poriform ; paraphyses distinct ; *spores* 8, colourless, *broadly lanceolato-fusiform*, 5-7-septate ; *gelatina hymenea* brownish or yellow with iodine.

On trees, very rare.

SYN :—*Sagedia lactea*, Körb. Syst. Lich. 366. (1855).

EXS :—Zw. 44.

GEOG. DISTRIB :—Germany, Hungary, Switzerland.

BOT. PROV :—2.

ENGLAND :—Sussex ! *Herb. Hooker*.

76. *V. olivacea*, Borr. *nigrescenti-olivaceo-virescent*, *sub-tartareous*, continuous or *rimose*, indeterminate ; *apothecia* dull-black, opaque, rugose, *invested by the thallus*, hemispherico-globose, internally pale ; *perithecium* *dimidiate*, black ; *epithecium* a minute pore ; *spores* 8, colourless, *singularly elongato-clavato-fusiform*, 7-septate, large.

On trees, rare. 1829.

SYN :—Borr. in E Bot. Suppl. 2597. (1829.) Leight. Ang. Lich. 42.

FIG :—E. Bot. Suppl. t. 2597. fig. 1. Leight. Ang. Lich. t. 18. f. 1.

EXS :—Leight. 199. Mudd 290.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2...5...8...10, 11...19.. 24...26, 27.

ENGLAND :—Sussex ! *Mr. Borrer*. (1829.) Gopsal ! Leicestershire. *Rev. A. Bloxam*. Airyholme ! ; Easby Wood ! Skutterskelf ! Ayton ! Cleveland. *Mr. Mudd*. New Forest. *Rev. J. M. Crombie*. Northumberland and Durham. *Mr. Winch*. Haughmond Hill ! ; Alberbury ! Shropshire.

IRELAND :—Kerry. *Dr. Taylor*. Bantry. *Miss Hutchins*. Killaloe, co. Clare ! ; Loughcooter, Galway ; Muckruss, Killarney ; Tullagreen and Ballyedmond, Cork. *Mr. Carroll*.

**\*\* *Perithecium* entire.**

77. *V. leptospora*, Nyl. *fuscescent*, very thin or obsolete ; *perithecium* entire, black ; *spores* 8, colourless, *fusiform*, elongate, 7-septate.

On holly, very rare. 1864.

SYN:—Nyl. in Flora 1864. p. 487. Crombie En. 117.

GEOG. DISTRIB:—Portugal.

BOT. PROV:—19.

IRELAND:—Dinis Island, Killarney. Mr. Carroll, (1864.)

G. *Spores murali-ocular.*

\* *Perithecium dimidiata.*

§ *Spores fuscous.*

78. *V. umbrina*, Whlbn. *fuscous or fuscous-black*, crustaceous, thin, opaque, smoothish or granuloso-unequal, *rimulose or sub-areolato-rimulose*, diffuse; *apothecia innate in prominent mastoid thalline tubercles*; *perithecium dimidiata*, black; inner tunic pale-brown; paraphyses none; spores 2, dull-green or fuscous, linear-oblong, rounded at each extremity, murali-ocular, large.

On rocks in rivers and sub-alpine lakes, not common.

SYN:—Whlbn. Fl. Succ. 871. pr. p. (1824.) Nyl. Scand. 269. *Endocarpon lithinum* and *fissum*, Leight. Ang. 19. & 20. *Verrucaria fissa*, Tayl. Fl. Hib. 2. 95.

FIG:—Leight. Ang. Lich. t. 6. f. 1. 2. 3.

EXS:—Leight, 98. Zw. 105. 313, 27. Hepp 103. 101. 949. Anzi It. S. 397. 399. Arn. 125.

GEOG. DISTRIB:—Germany, Italy, Hungary, Europe, Pyrenees, Scandinavia, Himalaya, N. America.

BOT. PROV:—7...11...15...19...30.

ENGLAND:—High Force, Teesdale! Durham. Rev. J. Harriman.

SCOTLAND:—Ben Lawers. Adm. Jones. Ben-y-gloe; Craig Tulloch. Rev. J. M. Crombie.

IRELAND:—Near Ardglass co. Down. Dr. Maingay. Carlg! Kerry. Dr. Taylor. Sunday's Well Weirs, Cork. Mr. Carroll.

WALES:—Rocky bed of river Dee at Llangollen! Denbighshire.

79. *V. scotinospora*, Nyl. *whitish*, scarcely any, or *evanescent*; *apothecia large*, prominent, sessile, *convexo-conical*, black; *epithecium large*, conspicuous, *umbilicato-depressed*; *perithecium dimidiata*, very thick, *nearly entire*, inner tunic black; paraphyses none; spores 8, fuscous, oblong, murali-ocular, cells irregular, moderate; gelatina hymenea vinous-red with iodine.

On alpine micaceo-schistose rocks, very rare. 1860.

SYN:—Nyl. Scand. 270. (1861.) Mudd Man. 282.

GEOG. DISTRIB:—Europe.

BOT. PROV:—7...15.

SCOTLAND:—Ben Lawers!; Head of Loch-na-Cat. Adm. Jones. (1860.) Summit of Craig na-Calliach. Dr. Maingay.

WALES:—Cwm Cywion, ! Glyder fach; Crib Goch! Snowdon.

80. *V. isidioides*, Borr. *yellowish-brown*, crustaceus, rimoso-areolate, *areolæ verrucose*, convex, *protuberant*, crowded and diffomed, smooth, opaque; *apothecia* dark-brown, *immersed in the depressed apex of the thallodal verrucæ*; ostiolum plano-convex, denuded, dark-brown; epithecium a simple pore; *perithecium* dimidiate, dark-brown, inner tunic pale-brown; paraphyses conglutinate; spores 8, linear-oblong, tapering towards each obtuse apex, colourless, 7-septate when young, ultimately fuscous and murali-locular, large; gelatina hymenea untinged with iodine.

On subalpine rocks, very rare. 1830.

SYN:—Borr. ! in E. Bot. Suppl. t. 2622. (1830.) Leight. Ang. Lich. 20.

FIG:—E. Bot. Suppl. t. 2622. f. 1. Leight. Ang. Lich. t. 6. f. 4.

GEOG. DISTRIB:—Europe.

BOT. PROV:—19.

IRELAND:—Glengariff ! near Bantry. *Miss Hutchins.* (1830).

81. *V. subpyrenophora*, Leight. *tawny-cinereous*, crustaceous, thin, *rimulose*, *minutely granulato-areolate*, (K—C—); *apothecia* large and conspicuous, black, *conical* or conico-hemispherical, the *base only enveloped by the thallus*, papillate or with a small pore; perithecium dimidiate, black; *paraphyses very slender, distinct*; spores 8, at first colourless, ultimately fuscous, elliptico-oblong, murali-locular, large.

On subalpine rocks, rare. 1871.

Somewhat externally like *V. verrucoso-areolata*, but distinct in having paraphyses and in the spores being two-thirds less in size.

GEOG. DISTRIB:—Europe.

BOT. PROV:—7.

WALES:—Cwm Cywion ! Glyder fach. (1871).

### §§ Spores colourless.

82. *V. intercedens*, Nyl. *cinerascent* or *cinereo-fuscescent*, tartareous, thin, *contiguous* or *rimulose*; *apothecia* large, *convexo-conical*, prominent, basally immersed, black; *epithecium* large, conspicuous, *umbilicato-depressed*; *perithecium* dimidiate; paraphyses none; spores 8, colourless, elliptical, murali-locular, cells irregular, moderate; gelatina hymenea vinous-red with iodine.

On alpine schistose rocks, rare. 1864.

SYN:—Nyl. Pyren. 33. (1858.) Scand. 276. Carroll in Seem. Journ. Bot. 3. 292.

FIG:—Hepp Sporen t. 51. f. 445. central spore.

EXS:—"Hepp 445." Arn. 146.

GEOG. DISTRIB:—Sweden, Switzerland, Pyrenees, Germany.

BOT. PROV:—2...15.

ENGLAND:—Downs, Sussex. *Mr. Larbalestier.*

SCOTLAND:—Ben Lawers. *Messrs. Jones & Carroll*, (1864.)

83. *V. fusco-argillacea*, (Anzi.) *fusco-cinerascent* or *albido-cinerascent*, thin, effuse, minutely rimulose or verrucoso-subareolate, unequal, at length farinaceous; *apothecia* black, moderate, numerous and crowded, sessile, innate at the base, hemispherical; *perithecium dimidiate*, thickish, black, inner tunic very thin, black; epithecium poriform, depressed or umbilicate; paraphyses none; *spores* 8, colourless, *rotundato-ellipsoid*, *murali-locular*, rather small; *gelatina hymenea* reddish with iodine.

On calcareous rocks, rare. 1870.

SYN:—*Polyblastia*, Anzi Symbola. 26. (1864).

EXS:—Anzi Langob. 368.

GEOG. DISTRIB:—Italy.

BOT. PROV:—15.

SCOTLAND:—Craig Tulloch, ! and at base of Ben-y-gloe, Blair Athole. *Rev. J. M. Crombie*. (1870).

84. *V. Carrollii*, (Mudd.) *greyish-white* or *cream-colour*, thin, determinate, membranaceo-cartilaginous, smooth, contiguous or slightly rimulose; *apothecia minute*, innate in elevated thalline protuberances, solitary, hemispherico-subdepressed; *ostiolum somewhat rugulose*, rounded or slightly depressed; epithecium obsolete; *perithecium dimidiate*, brownish-black, inner tunic pale; *paraphyses distinct*, capillary, flexuose; *spores* 6-8, pale-yellow, elliptico-oblong or obovate, irregularly murali-locular, very variable in size.

On young ash trees, and sandstone, very rare. 1861.

SYN:—*Sphaeromphale*, Mudd Man. 283. (1861).

FIG:—Mudd Man. t. 5. f. 115.

GEOG. DISTRIB:—Europe.

BOT. PROV:—19...24...28.

IRELAND:—Rottellin, Cork Harbour; and Castleconnel, Limerick; Ballaghbeanna Gap, Kerry; Dims, Killarney. *Mr. Carroll*. (1861.) Armagh Demonee. *Adam Jones*.

\*\* *Perithecium entire.*§ *Spores fuscous.*

85. *V. tristicula*, Nyl. *fuscous*, *slightly granulose*, effuse; *apothecia black*; *perithecium ellipsoid, entire*, black, firm, rugulose, *subconically prominent*; *epithecium punctiformi-impressed*; *paraphyses none*; *spores 1*, fuscous, oblong, murali-locular; *gelatina hymenea vinous-red with iodine*.

On mosses, very rare. 1864.

SYN :—Nyl. in Flora 1865. p. 356. Carroll in Seem. Journ. Bot. 4. 24.

GEOG. DISTRIB :—Europe.

BOT. PROV :—19.

SCOTLAND :—Aviemore in Strathspey. Adm. Jones. (1864).

86. *V. terebrata*, (Mudd.) *dirty-white or smoky-brown*, tartareous, thin, *contiguous* or *evanescent*; *apothecia deeply immersed in the rock*, small, plane or sub-convex; *perithecium entire*, black, inner tunic dark-brown; *paraphyses none*; *spores 4-8*, fuscous or fuscous, oblong or ovate, murali-locular.

On calcareous mountain rocks, rare.

SYN :—*Sphæromphale*, Mudd Man. 281. (1861.) *Verr. umbrina* var. *calcareo*, Nyl. Pyren. 21. in part.

GEOG. DISTRIB :—France.

BOT. PROV :—10...15...30.

ENGLAND :—Penhill, Yorkshire. Mr. Baker.

SCOTLAND :—Near Castleton; Morrone, Braemar. Adm. Jones.

IRELAND :—Glenarm, Antrim. Adm. Jones.

87. *V. rupifraga*, (Mass.) *darkly cinereo-albescent tartareo-farinose*, pulverulent, effuse; *apothecia black, entirely immersed in the rock*, sphaerical; *perithecium entire*, black; *ostiolum plane or plano-convex*; *epithecium a minute pore*; *paraphyses none*; *spores 4* (—6 —8 Mass.) fuscous, ovoid or ellipsoid, murali-locular, large; *gelatina hymenea vinous with iodine*.

On calcareous rocks, rare. 1869.

SYN :—Mass. Symm. p. 100. (1855.) Crombie En. 109.

GEOG. DISTRIB :—Italy, Bavaria.

BOT. PROV :—15.

SCOTLAND :—Craig Guie, Grampians. Rev. J. M. Crombie. (1869.)

88. *V. nigrata*, Nyl. *fuscous-black*, thin, areolato



unequal, *sub-granulose*, effuse ; *apothecia black, immersed, small* ; ostiolum black, somewhat prominent, plano-convex ; *epithecium impressed* ; *perithecium entire* ; paraphyses distinct, short, dissolving ; spores 8, *fuscous*, ellipsoid, irregularly murali-ocular, *small* ; gelatina hymenea dull-blue-green, then vinous-red-yellow with iodine.

On mossy earth in alpine places, very rare. 1860.

SYN :—Nyl. Prodr. 184. (1857.) *Sphæromphale*, Mudd Man. 283.

GEOG. DISTRIB :—Pyrenees.

BOT. PROV :—15.

SCOTLAND :—Summit of Ben Lawers. *Adm. Jones*. (1860.)

89. *V. Henscheliana*, (Körb) *cinereo-fuscous or nigro-fuscous*, effuse, *thin*, tartareous, *unequal* ; *apothecia black, large, sub-globoso-tuberculiform, somewhat conical*, sessile ; *epithecium papillate with a simple conspicuous pore* ; *perithecium entire*, nigro-fuscous ; paraphyses slender, diffuent ; filamenta ostiolaria distinct ; spores 8, large, oblongo-ellipsoid, irregularly murali-ocular, at first colourless or fuscous, ultimately fuscous ; gelatina hymenea pale-vinous with iodine.

On micaceo-schistose alpine rocks, not unfrequent. 1869.

SYN :—*Sphæromphale*, Körb. S. L. G. 336. (1855.) *Sporodictyon*, Körb. Parerg. 332.

GEOG. DISTRIB :—Germany.

BOT. PROV :—15.

SCOTLAND :—Ben Voirloch ! *Dr. Stirton*. (1869.) Craig Tulloch ! Blair Athole. *Rev. J. M. Crombie*.

90. *V. theleodes*, Smrft. *creamy-white*, thick, tartareous, *ruguloso-areolate, with large, scattered, rugose, prominent verrucæ* ; *apothecia very large, inclosed in the thalline verrucæ* ; ostiolum black, more or less denuded, depresso-convex ; epithecium perforate, simple ; *perithecium entire*, black, very thick ; paraphyses none ; filamenta ostiolaria very large and distinct ; spores 8, dark brown, broadly ellipsoid, murali-ocular, very large ; gelatina hymenea vinous-red with iodine.

On micaceo-schistose alpine rocks, rare. 1860

SYN :—Smrft. Lapp. 140. (1826.) Schær. Enum. 215. Carroll in Seem. Journ. Bot. 3. 292.

GEOG. DISTRIB :—Norway.

BOT. PROV :—15.

SCOTLAND :—Summit of Ben Lawers. *Adm. Jones*. (1860.) *Craig Guie. Rev. J. M. Crombie*.

forma *verrucoso-areolata*, (Schær.) similar to the type, but with a *dimidiate perithecium* and spores so dark in an old state as to make the muriform divisions almost invisible.

On micaceo-schistose alpine rocks, rare. 1860.

SYN :—*Lecanora atra* var. *verrucoso-areolata*, Schær. Enum. 37. (1850.) *Verrucaria*, Nyl. Pyren. 34. Scand. 270. *Sphæromphale*, Mudd Man. 282. Carroll in Seem. Journ. Bot. 3. 292.

FIG :—Mudd Man. t. 5. f. 119.

EXS :—Schær. 538. Anzi Langob. 236.

GEOG. DISTRIB :—Switzerland, Hungary.

BOT. PROV :—15.

SCOTLAND :—Ben Lawers ! *Adm. Jones*. (1860).

A forma *inundata*, Nyl. in litt. occurs on sandstone rocks, rare, at Ballaghbeama Gap, Kerry. *Mr. Carroll*. and in a stream at Cromaglow, Killarney. *Adm. Jones*.

91. *V. sub-umbrina*, Nyl. *fusco-cinereous* or *cinereo-fuscescent*, thin, *rimose*, determinate ; *apothecia* moderate, *mastoideo-prominent*, covered by the *thallus*, *ostium* denuded ; *perithecium* entire, black ; spores 8, *fuscogrescent*, ellipsoid, *murali-ocular*, large.

On schistose rocks in subalpine streams, rare. 1864.

SYN :—Nyl. in *Ofvers. V. Ak. Förh.* 1860. p. 296. Scand. 269. Carroll in Seem. Journ. Bot. 3. 292.

GEOG. DISTRIB :—Scandinavia.

BOT. PROV :—15...22.

SCOTLAND :—Ben Lawers. *Adm. Jones*. (1864.) Gorchloch, shores of Perth or Inverness. *Mr. Larbalestier*.

IRELAND :—Tonlagree co. Wicklow. *Mr. Archer*.

92. *V. pituphloia*, Leight. *evanescent* ; *apothecia* black, moderate, scattered, *hemispherico-conoid*, sessile, *prominent* ; *perithecium* entire, black ; *paraphyses* *indistinct* ; spores 8, fuscous, *elliptico-oblong*, 5-septate, *murali-ocular* ; *gelatina hymenea* vinous-red with iodine.

On larch poles, rare. 1861.

GEOG. DISTRIB :—Europe.

BOT. PROV :—5.

ENGLAND :—Shrewsbury, ! Shropshire. (1861).

93. *V. pyrenuloides*, (Mnt.) var. *Hibernica*, Nyl. similar to *V. nitida*, but with aggregate apothecia and multilocular fuscous spores 4-8, cells in 12 or more

plurilocular series ; gelatina hymenea and asci slightly vinous-red with iodine.

On hazel, very rare. 1867.

SYN :—Nyl. in Flora 1868. p. 193. Crombie En. 118.

GEOG. DISTRIBUTION :—Europe.

BOT. PROV :—19.

IRELAND :—Turk Mountain and Eagle's Nest, Killarney. *Mr. Carroll*. (1867).

94. *V. Sendtneri*, (Kphbr.) albido-cinereous, cartilaginous, incrusting, contiguous, squamuloso-effigurate, smooth and unequal ; apothecia black, minute, globose, immersed, then emergent ; epithecium umbilicate ; perithecium black, entire ; spores 8, pallido-fuscescent, ovoid, murali-locular ; paraphyses none ; gelatina hymenea vinous-red with iodine.

On mossy earth in alpine regions, rare. 1865.

SYN :—*Polyblastia*, Kphbr. in Flora 1855. p. 67. *Verrucaria*, Nyl. Pyren. 33. Carroll in Seem. Journ. Bot. 3. 292.

FIG :—Hepp Sporen t. 51. f. 447.

EXS :—Hepp 447. Arn. 130. Anzi Langob. 220.

GEOG. DISTRIBUTION :—Switzerland, Bavaria, Italy.

BOT. PROV :—15.

SCOTLAND :—Summit of Ben Lawers. *Messrs. Jones & Carroll*. (1865).

95. *V. pallida*, (Ach.) pallido-rufescent or fuscescent, squamulose, squamæ imbricate, flexuose, lobate, sub-crenate ; apothecia minute, immersed ; ostiolum protruded, prominent, brownish-black ; epithecium a simple pore ; perithecium entire, dark-brown ; spores 2, pale-yellow, lineari-oblong, 1-septate, murali-locular, large.

On earth-covered rocks, very rare. 1813.

SYN :—*Endocarpon*, Ach. L. U. 301. (1810.) Syn. 100. Leight. Ang. Lich. 19. *Verrucaria*, Nyl. Prodr. 178. Pyren. 20. Scand. 268.

FIG :—E. Bot. t. 2541. Leight. Ang. Lich. t. 5. f. 3.

GEOG. DISTRIBUTION :—Europe, Sweden, Algeria, N. America.

BOT. PROV :—19.

IRELAND :—Southern portion ! *Sir T. Gage*. (1813).

96. *V. Garovaglii*, Mnt. fuscescent, crustaceo-concrescent, squamulose, squamules small, closely adnate, slightly elevated, lobed and crenate at the circumference ; apothecia minute, immersed ; ostiolum prominent, naked, black ; epithecium a simple pore ; perithecium entire, black ;

paraphyses none ; filamenta ostiolaria minute, slender, crowded ; spores 2, green or pale-yellowish-brown, lineari-oblong, 1-septate, murali-locular, large.

On earth-covered maritime rocks, very rare. 1809.

SYN:—Mnt. in Ann. Sc. Nat. ser. 3. vol. 11. p. 59. (1849.) Nyl. Pyren. 20. *V. sorediata*, Borr. in E. Bot. Suppl. 2612. Leight. Ang. Lich. 18.

FIG:—E. Bot. Suppl. t. 2612. f. 2. Leight. Ang. Lich. t. 5. f. 2.

EXS:—Nyl. 90. Hepp 100. Zw. 210. Arn. 99. Th. M, Fr. 22.

GEOG. DISTRIB:—France, Switzerland, Germany, Bavaria, Sweden, Hungary.

BOT. PROV:—2...4.

ENGLAND:—Thetford. *Mr. Turner*. (1809.) Rottingdean Cliffs ! Sussex. *Mr. Borrer*.

### §§ Spores colourless.

97. *V. hymenogonia*, Nyl. *whitish* or *pale-grey*, very thin, *leproso-tartareous* or *evanescent* ; apothecia moderate, prominent, *semi-immersed*, *convex* ; *perithecium entire*, black ; paraphyses none ; spores 8, colourless, lineari-oblong, murali-locular, often 1-septate ; gonidia hymenea oblong, green ; gelatina hymenea vinous-red with iodine.

On mortar and calcareous rocks, not common. 1830.

SYN:—Nyl. Prodr. 185. (1857.) Pyren. 32. *Verr. muralis*, Leight. Ang. Lich. 46.

FIG:—E. Bot. Suppl. t. 2647. f. 2. Leight. Ang. Lich. t. 20. f. 1.

GEOG. DISTRIB:—France, Belgium, Italy.

BOT. PROV:—1. 2, 3.. 5...7...15...19.

ENGLAND:—Sussex ! *Mr. Borrer*. (1830.) Exeter. *Mr. Parfitt*. Messing, Kelvedon ; Mistley, Essex. *Mr. Varenne*. Wenlock ! Shropshire.

SCOTLAND:—Morrone. *Adm. Jones*. Craig Guie, Braemar. *Rev. J. M. Crombie*.

IRELAND:—Glanmuir ! ; near Riverstown, Cork. *Mr. Carroll*.

WALES:—Bridge below Idlyn Bodlyn ! Merionethshire. *Rev. T. Salwey*. Aberdovey ! *Rev. A. Bloxam*.

98. *V. inumbrata*, Nyl. *fuscous* or darkly cinereo-fuscous or dark-tawny, thin, effuse, unequal, often dispersed ; apothecia moderate, covered with the thallus ; ostiolum naked ; epithecium most minute, generally impressed ; perithecium entire, black ; spores 8, colourless, oblongo-ellipsoid or ellipsoid, murali-divided ; gelatina hymenea vinous-red with iodine.

On alpine micaceo-schistose rocks, very rare. 1864

SYN :—Nyl. in Flora 1864. p. 255. Carroll in Seem. Journ. Bot. 3. 292.

GEOG. DISTRIB :—Europe.

BOT. PROV :—15.

SCOTLAND :—Ben Lawers. *Adm. Jones*. (1864.)

*H. Parasitic species.*

\* *Perithecium dimidiata.*

§ *Spores colourless.*

99. *V. allogena*, Nyl. *apothecia* black, at length prominent ; *perithecium* black, *dimidiate*, the immersed or lower portion nearly colourless or slightly fuscous ; *paraphyses* distinct ; spores 8, colourless, oblong, 1-septate, in form and size like those of *V. epidermidis*.

Parasitic on thallus of *Lecidea excentrica*, on micaceous schistose alpine rocks, very rare. 1864.

SYN :—Nyl. in Flora 1865. p. 357. Carroll in Seem. Journ. Bot. vol. 4 p. 25.

GEOG. DISTRIB :—Europe.

BOT. PROV :—15.

SCOTLAND :—Near summit of Ben Lawers. *Mr. Carroll*. (1864).

100. *V. endococcoidea*, Nyl. *apothecia* black, minute, *endococcoid* ; immersed portion of the *perithecium* thin and fuscous, upper visible portion somewhat convex ; *paraphyses* none ; spores 8, colourless, oblongo-ellipsoid, 3-septate, pale blue with iodine ; *gelatina hymenea* vinous-red with iodine.

Parasitic on thallus of *Lecidea excentrica*, (Ach.) in alpine localities, very rare. 1865.

SYN :—Nyl. in Flora 1865. p. 356. Carroll in Seem. Journ. Bot. 4. 25.

GEOG. DISTRIB :—Europe.

BOT. PROV :—15...19...23.

SCOTLAND :—Near summit of Ben Lawers. *Mr. Carroll*. (1865).

IRELAND :—Killarney and near Dublin, *Adm. Jones*.

§§ *Spores fuscous.*

101. *V. microstictica*, (Leight.) *apothecia* black, very minute, immersed or semi-immersed ; *ostiolum* black, plano-convex ; *epithecium* a minute pore ; *perithecium dimidiata*, brown ; *paraphyses* distinct, flocculose, branched, entangled ; spores 8, fuscous, oblong, 1-septate, minute.



Parasitic on thallus of *Lecanora cervina*, rare. 1856.  
Possibly only a *fungillus*.

SYN :—*Endocarpon*, Leight. Exs. 317. (1858).

EXS :—Leight. Exs. 317.

GEOG. DISTRIB :—Europe.

BOT. PROV :—7.

WALES :—Borthwen ! Barmouth. (1856).

102. *V. hetairizans*, Leight. apothecia black, minute, immersed; perithecium black, dimidiate; ostiolum minute, denuded, black; epithecium minute, impressed; paraphyses indistinct; spores 8, fuscous, linear, rounded at each extremity, 3-septate, constricted.

Parasitic on thallus of *Verrucaria submersa*, Borr. E. Bot. Suppl. 2768, rare. 1851.

In my Ang. Lich. I must have taken this for the mature state of the spores of *V. submersa*, which are as represented in E. Bot. Suppl. l. c. Recent re-examination shews me that there are two lichens consociated on the same thallus. Possibly the present one may be only a *fungillus*.

SYN :—*V. margacca*, Leight. Ang. Lich. p. 62. excl. syn. (1851).

FIG :—Leight. Ang. Lich. t. 26. fig. 3. E.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2.

ENGLAND :—Sussex ! *Mr. Borrer*.

### \*\* *Perithecium entire*.

#### § Spores colourless.

103. *V. superposita*, Nyl. apothecia black, turgid; perithecium entire, black; epithecium impressed; paraphyses none; spores 8, colourless, ovoid, 1-septate; gelatina hymenea vinous-red with iodine.

Parasitic on *Verrucaria theleodes*, Smrft. very rare. 1865.

"Not unlike *V. Borreri*, in miniature."

SYN :—Nyl. in Flora 1865. p. 357. Carroll in Seem. Journ. Bot. 4. 25.

GEOG. DISTRIB :—Europe.

BOT. PROV :—15.

SCOTLAND :—Near the summit of Ben Lawers. *Mr. Carroll*. (1865).

104. *V. innata*, Nyl. apothecia innate, minute; perithecium entire, black; paraphyses few, irregular or scarcely any; spores 8, colourless, ovoid, 1-septate; gelatina hymenea untinged or lutescent with iodine.

Parasitic on thallus of *Lecidea Hookerii*, Schær. in alpine localities, very rare. 1865.

SYN:—Nyl. in Flora 1865. p. 358. Carroll in Seem. Journ. Bot. 4. 26.

GEOG. DISTRIB:—Europe.

BOT. PROV:—15.

SCOTLAND:—Summit of Ben Lawers. *Adm. Jones*. (1865).

105. *V. epipolytropa*, (Mudd.) *apothecia* black, very minute, numerous, irregularly scattered, *immersed or semi-immersed*, globose, internally pale; *ostiolum* denuded, *plano-convex*, slightly shining; *epithecium* minutely poriform; *perithecium* entire, of a bluish-green hue; *paraphyses* distinct, slender, branched; *spores* 4, 6 or 8, colourless, *oblongo-subclavate*, 1-septate, constricted, minute, very similar in form to those of *V. epidermidis*; *gelatina hymenea* rubescent with iodine.

Parasitic on *Lecanora polytropa* and *intricata* and *Squamaria saxicola*, rare. 1861.

SYN:—*Thelidium*, Mudd Man. 298. (1861)

EXS:—Mudd 287.

GEOG. DISTRIB:—7...10.. 15.

ENGLAND:—Cliffriigg!; Ayton Moor, Cleveland. *Mr. Mudd*. (1861).

SCOTLAND:—Highlands. *Adm. Jones*.

WALES:—Cwm Glas! Snowdon.

### §§ *Spores fuscous.*

106. *V. haplotella*, (Nyl.) *apothecia* minute, convex, prominent, aggregate, black; *perithecium* entire; *spores* numerous, pallido-nigrescent, ellipsoid or oblong, *simple*.

Parasitic on *Opegrapha varia* f. *diaphora*, very rare.

SYN:—*Endococcus*, Nyl. in Flora 1867. p. 180. Crombie En. 122.

GEOG. DISTRIB:—Denmark, Madeira.

BOT. PROV:—19.

IRELAND:—Muckruss Demesne, Killarney. *Mr. Carroll*.

107. *V. ventosicola*, (Mudd.) *apothecia* minute, semi-immersed in minute *thallodal verrucæ*, globose, black; *perithecium* entire; *spores* 30-50, fuscous, elliptical or oblong, 1-septate.

Parasitic on *Lecanora ventosa*, very rare. 1861.

SYN:—*Microthelia*, Mudd Man. 307. (1861).

GEOG. DISTRIB:—Europe.

Exs :—Mudd 300. on Leight. 9.

BOT. PROV :—7...10.

ENGLAND :—Kildale Moor, Cleveland. *Mr. Mudd.*

WALES :—Penmaenmawr ! Carnarvonshire.

108. *V. calcaricola*, (Mudd.) *apothecia* of medium size, *sessile* or slightly immersed, *globose*, black ; perithecium entire ; spores 8, fuscous, elliptico-oblong, 1-septate, *large*.

Parasitic on *Lecanora cinerea*, *calcareo* and *gibbosa*. rare.

SYN :—*Microthelia*, Mudd Man. 306. (1861).

FIG :—Mudd Man. t. 5. f. 128.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2...5...15...23.

ENGLAND :—Near Lewes, Sussex. *Mr. Unwin*. Spout Valley, Long Mynd ! Shropshire.

SCOTLAND :—Near Ben Lawers and Morrone. *Rev. J. M. Crombie*.

IRELAND :—Killiney. *Adm. Jones*.

109. *V. gemmifera*, Tayl. *apothecia* minute, *semi-immersed*, *sub-hemispherico-globose*, black ; perithecium entire ; epithecium depressed ; spores 8, fuscous, broadly oblong, 1-septate, *minute*.

Parasitic on *Lecidea contigua*, frequent 1836.

SYN :—*Verrucaria*, Tayl. Fl. Hib. 2. 95. (1836.) Leight. Ang. Lich. 47.

FIG :—Leight. Ang. Lich. t. 29. f. 3.

Exs :—Leight. 137.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1...5...7...10...15...19.

ENGLAND :—Craigforda ! near Oswestry, Shropshire ; Penzance, Cornwall. *Rev. T. Salwey*, Guisbro' Moor, Cleveland. *Mr. Mudd*. Haughmond Hill ! Shropshire.

SCOTLAND :—Grampians. *Rev. J. M. Crombie*. Portree. *Rev. Prof. Ch. Babington*.

IRELAND :—Dunkerron ! *Dr. Taylor*. (1836).

WALES :—Barmouth ! *Rev. T. Salwey*. Glyder Vach ! Snowdonia. Llyn Cae ! Cader Idris.

110. *V. perpusilla*, (Nyl.) *apothecia* very minute, *immersed*, *globoso-depressed*, black ; epithecium large ; perithecium entire ; spores 8, fuscous, oblong, 1-septate.

Parasitic on *Lecanora cinerea*, rare. 1869.

SYN :—*Endococcus*, Nyl. Prodr. 193. (1861.) Crombie En. 123.

GEOG. DISTRIB :—France.

BOT. PROV :—7...15.

SCOTLAND :—Ben Cruachan. *Rev. J. M. Crombie.*

WALES :—Llyn Cae! Cader Idris. (1869).

111. *V. erratica*, (Mass.) *apothecia* minute, *semi-immersed* or *sub-emersed*, globose, black; perithecium entire; spores numerous, fuscous, broadly elliptical, half the size of those of *V. gemmifera*.

Parasitic on *Lecanora calcarea*, *Lecidea lapicida*, *Lecanora polytropa* &c. not unfrequent. 1851.

SYN :—*Tichothecium*, Mass. ! Neag. p. 9. (1854.) *Endococcus*, Nyl. Seand. 283. *Verrucaria gemmifera* var. Leight. Ang. Lich.

47. *Microthelia pygmæa*, Kbr. Mudd Man. 307.

FIG :—Leight. Ang. Lich. t. 20. f. 4.

EXS :—Arn. 247. Anzi Langob. 289. Anzi Venet. 161.

GEOG. DISTRIB :—France, Italy, Pyrenees, Germany, Bavaria, Asia minor.

BOT. PROV :—5 ..7...10, 11...15...18, 19...28.

ENGLAND :—Durham ! *Rev. J. Harriman.* (1851.) near Battersby, Cleveland. *Mr. Mudd.* Long Mynd ! near Church Stretton ; Caer Caradoc ! Shropshire.

SCOTLAND :—Loch Coriskin ! Skye. *Rev. Prof. Churchill Babin-* *ington.* Head of Loch-na-Cat ; Braemar. *Adm. Jones.* Grampians, Breadalbane and Braemar. *Rev. J. M. Crombie.*

IRELAND :—Sheep walk, Armagh ; Killiney ; Dublin ; Cusquin-  
by ; Cork Harbour. *Adm. Jones.* Mangerton. *Mr. Carroll.*

WALES :—Crib Goch ! Snowdon ; Corwen ! ; very summit of  
Snowdon ! Barmouth ! Cader Idris north side !

112. *V. rimosicola*, Leight. thallus none ; apothecia black, minute, sessile, hemispherical, somewhat shining ; perithecium entire, black ; epithecium a very minute pore ; paraphyses none ; filamenta ostiolaria none ; spores 8, fuscous, oblong or lineari-oblong, 3-septate, constricted, minute ; gelatina hymenea vinous-red with iodine.

Parasitic on *Lecidea excentrica*, frequent. 1856.

SYN :—Leight. Exs. 253. (1856.) Mudd Man. 308. *V. advenula*, Nyl. in Flora 1865. p. 606.

FIG :—Ann. and Mag. Nat. Hist. ser. 2. vol. 13. t. 3. f. 10.

EXS :—Leight. 253. Mudd 301. Anzi Langob. 370. Arn. 379.  
Hepp 947.

GEOG. DISTRIB :—Germany, Italy.

BOT. PROV :—5...10...15, 16...19... 26...27.

ENGLAND :—Carlton Bank ! Cleveland. *Mr. Mudd.* Penhill,  
Yorkshire. *Mr. Baker.* Wrekin Hill ! Shropshire. (1856).

SCOTLAND :—Ben Lawers ! *Adm. Jones.* Appin. *Rev. J. M. Crombie.*

IRELAND :—Killarney. *Adm. Jones.* Loughcooter, Galway. *Mr. Carroll.*

113 *V. nigritella*, Nyl. black, magmoid (probably not the proper thallus but only algæ); *apothecia* black, small; *perithecium* entire, black, somewhat prominent; *epithecium* scarcely impressed; paraphyses none; *spores* 8, fuscous, ellipsoid or oblongo-ellipsoid, variously or murali-locular, small, (like those of *Urceolaria scruposa*.)

On the thalline squamæ of *Verrucaria tephroides*, very rare. 1864.

SYN:—Nyl. in Flora 1865. p. 357. Carroll in Seem. Journ. Bot. 4. 25.

FIG:—Leight. Ang. Lich. t. 11. f. 3. B.

GEOG. DISTRIBUTION:—Europe.

BOT. PROV:—15.

SCOTLAND:—Summit of Ben Lawers. Mr. Carroll. (1864).

### V. STRIGULA, Fries.

Thallus hypophlæodal. Apothecia solitary, subinnate; perithecium sub-globose, collapsing, at length dehiscent by an irregular fissure or pore; nucleus gelatinous when moist, black and rigid when dry; paraphyses indistinct. Spores colourless, 3-septate.

1. *S. Babingtonii*, Berk. greyish, thin, filmy; apothecia dark-brown or nearly black, minute, scattered, depressed; spores 8, colourless, sub-cymbiform, 3-septate.

Parasitic on coriaceous perennial leaves, as laurel, box, arbutus, rare.

SYN:—Berk. E. Bot. Suppl. t. 2957. (1849.) Leight. Ang. Lich. 70.

FIG:—E. Bot. Suppl. t. 2957.

EXS:—Leight. 35.

GEOG. DISTRIBUTION:—Europe.

BOT. PROV:—2, 4, 8, 10, 11.

ENGLAND:—Cambridge! Rev. Prof. Ch. Babington. Gopsall! Leicestershire. Rev. A. Bloxam. Hurstpierpoint! Mr. Mitten. Ormesby! Cleveland; Rokeby, Durham. Mr. Mudd.

### VI. MELANOTHECA, Fée.

Thallus scarcely any. Apothecia verrucaroid, not simple but numerous, 3-10 or more confluent, hymenia scarcely distinct; perithecium black. Spores 8, variously internally divided.

1. *M. gelatinosa*, (Chev.) pallescent, macular, deter-



minate ; *apothecia* round or oblong, opaque, depressed, unequal, internally white ; *perithecia* numerous, minute ; *spores* 8, colourless, oblongo-ovoid, 3-septate, small ; paraphyses none ; *hypothecium* colourless.

On young trees, frequent.

SYN :—*Arthonia*, Chev. Journ. Phys. 1822. p. 54. Nyl. Pyren. 70.

EXS :—Leight. 223. 358. Mudd 232. Rabh. 780.

GEOG. DISTRIB :—Switzerland, France.

BOT. PROV :—1. 2...5...7...10...15...(19—30)...31.

ENGLAND :—Sussex ! *Mr. Borrer*. Baysdale ! Cleveland. *Mr. Mudd*, Torquay ! *Dr. Deakin*, Stableford ! Shropshire.

SCOTLAND :—Glen Cluny, Braemar ; Glen Lochay, Breadalbane. *Rev. J. M. Crombie*.

IRELAND :—Not frequent. *Mr. Carroll*.

WALES :—Woods at Glyn ! and opposite Tanybwlech Hotel, Capel Curig !

CHANNEL ISLANDS :—Rozel, Jersey. *Mr. Larbalestier*,

2. *M. diffusa*, Leight. pallido-glaucescent or pallido-cinerascent, diffuso-macular, indeterminate ; *apothecia* large, irregularly round, or lineari-oblong, numerous, diffuse and sub-confluent, opaque, depressed, unequal, internally colourless ; *perithecia* numerous, prominent and large ; *spores* 8, fuscous, lineari-oblong, 1 septate, constricted in the middle, large.

On young trees, rare. 1865.

GEOG. DISTRIB : Europe.

BOT. PROV :—7.

WALES :—Nant-Gwynant ! Snowden. (1865.) wood opposite Tanybwlech Hotel, Capel Curig !

## VII. ASTROTHELIUM, *Eschw.*

*Perithecia* several, stellato-congregate, their ostiola converging into one common central poriform epithecium.

1. *A. parmularia*, (Berk.) pale-yellow, thin, membranous, continuous, smoothish and shining ; *apothecia* enclosed in upraised prominent thallodal verrucae ; *perithecium* entire, black ; paraphyses indistinct ; *spores* 8, fuscous, broadly lineari-oblong, 1 septate, large.

On young oaks, very rare. 1851.

SYN :—*Sphaeria parmularia*, Berk. in Hook. Journ. 1851. p. 19.

GEOG. DISTRIB :—South of France.

BOT. PROV :—2.

ENGLAND :—New Forest, Hants. *Rev. M. J. Berkeley*. (1851)

## ADDITIONS AND CORRECTIONS.

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Page 7. *CHLOREA*. This genus should be omitted, as it is very doubtful if it has ever been found in Great Britain. No authenticated British specimens exist in any public or private herbaria. The lichen which the older lichenists termed *Lichen vulpinus*, is now ascertained to be *Physcia flavicans*.

Page 11. *Gonionema velutinum*, Cwm Bochlwyd ! Cwm Idwall ! Cwm Cywion ! Aran Mowddu !

Page 11. *Spilonema paradoxum*, Cwm Cywion ! Cwm Fynnon Iloer !

Page 12. *Ephebe pubescens*, Cwm Bochlwyd ! Pass of Llanberis !

Page 17. *Collema chalazanum*, Eglswg rocks !

Page 18. *Collema pulposum*, common on all the Channel Islands. *Mr. Lorbalestier*. Llanyblodwell Rocks ! Llanymynech Hill ! Shropshire.

Page 20. *Collema cheileum*, common on all the Channel Islands, *Mr. Lorbalestier*.

Page 20. *Collema melanum*, La Moie, Jersey. *Mr. Lorbalestier*.

Page 21. *Collema crispum*, L'Etacq, Jersey : and also a var. *cristatum* Nyl. in Herm. *Mr. Lorbalestier*.

Page 22. *Collema plicatile*, Jersey, rare. *Mr. Lorbalestier*.

Page 22. *Collema microphyllum*, St. Martin's Quenvais, Jersey, *Mr. Lorbalestier*.

Page 25. *Collema nigrescens*, Jersey and Guernsey, frequent ; Seigneurie, Sark. *Mr. Lorbalestier*.

Page 25. *Collema flaccidum*, St. Martin's Jersey. *Mr. Lorbalestier*. Llanyblodwell rocks !

Page 26. *Collema aggregatum*, near Exeter. *Rev. J. M. Crombie*.

Page 26. *Collema multipartitum*, Eglswg rocks ! Llanymynech Hill !

Page 26. *Collema psorellum*, above Loch-na-cat. *Rev. J. M. Crombie*.

Page 31. *Leptogium subtile*, near Exeter. *Rev. J. M. Crombie*.

Page 32. *Leptogium lacerrum*, Eglswg rocks ! Llanymynech Hill ! var. *pulvinatum*, Eglswg rocks !

Page 34. *Leptogium lacerrum*, var. *fimbriatum*, Hoffm. (Fl. Germ. 104 Dill. t. 19. f. 31. c.) lobes broader and more entire, margins densely fimbriate and ciliate, ciliae excessively branched. Killin. *Rev. J. M. Crombie*.

Page 34. Add *Leptogium microscopicum*, Nyl. (Prodr. 26, Syn. 122. t. 4. f. 17) olivaceo-nigricant, most minutely fruticulose, effuse, branched, erect, unequally terete, branchlets elongato-papillate,

sterile. This I have seen from the Channel Islands collected by Mr. Larbalestier, and have myself gathered it on Llanymynech Hill, Shropshire, but always sterile. Probably only a diminutive state of *L. lacerum*.

Page 34. *Leptogium palmatum*, Blair Athole. Rev. J. M. Crombie.

Page 35. *Leptogium rhyparodes*, for 1864 read 1863. Above Loch-na-cat. Rev. J. M. Crombie.

Page 38. *Sphinctrina turbinata*, Capel Curig, N. Wales!

Page 42. *Culicium brunneolum*, New Forest. Rev. J. M. Crombie.

Page 43. *Calicium trachelinum*, Braemar. Rev. J. M. Crombie. Edderton! Montgomeryshire.

Page 44. *Calicium curtum*, Rozel, Jersey. Mr. Larbalestier. Falls of Bruar, Blair Athole. Rev. J. M. Crombie. Llanyblodwell rocks!

Page 45. *Culicium subtile*, New Forest. Rev. J. M. Crombie. Pop-hills. Mr. Purton.

Page 45. line 12, erase "obsolete."

Page 45. *Calicium citrinum*, Stavely near Kendal, Westmoreland, and Dent, Yorkshire. Mr. Martindale. Glen Fender, Blair Athole. Rev. J. M. Crombie.

Page 46. *Coniocybe furfuracea*. Blair Athole, Rev. J. M. Crombie. Broomhall, near Oswestry! Edderton! Montgomeryshire.

Page 48. *Trachylia tigillaris*, Colchester. Rev. J. M. Crombie, Felixstow, Suffolk, Mr. Larbalestier.

Page 48. *Trachylia tympanella*, Jersey. Mr. Larbalestier. Haughmond Hill!

Page 50. *Sphaerophoron coralloides*, Jersey, Guernsey, Alderney and Sark. Mr. Larbalestier.

Page 53. line 2. for "Ireland" read "Scotland."

Page 53. *Bæomyces placophyllus*. Longmynd!

Page 54. *Bæomyces icmadophilus* under FIG. read Nyl. Syn. t. 6. f. 7. 8. 9. 10. 11 and t. 7. f. 2. Ardingley, Sussex, Mr. Larbalestier.

Page 55. *Pycnothelia papillaria*, Wales, Llyn Crafnant!

Page 57. *Cladonia cervicornis*, Llyn Crafnant! Cwm Cywion!

Page 64. *Cladonia degenerans*, every where common in the Grampians. Rev. J. M. Crombie.

Page 67. et passim, for Basingstoke, Kent, read Hants.

Page 68. *Cladonia deformis*, for E. Bot. t. 1394 read t. 1374. Hay Coppice, Herefordshire! Rev. T. Salwey.

Page 70. f. *polydactyla*, for Leight. 174 read Leight. 274.

Page 75. *Cladonia uncialis*, Capel Curig! Llyn y Cwn! and var. *turgescens*, Cwm Idwall!

Page 76. *Pilophoron fibula*, add to Geog. Distrib. Lapland, and see Nyl. Lapp. Or. 179. Scotland, Morrone, Ben Cruachan. Rev. J. M. Crombie. near Cuchullin Hills, near Sligachan, Isle of Skye! Mr. Piggot, Wales, Cwm Cywion! Cwm Fynnon Iloer! Cwm Clyd!

Page 77. *Stereocaulon coralloides*, Capel Curig (fruit)! Cwm Cywion! Aran Mowddu!

Page 78. *Stereocaulon denudatum*. Cwm Idwall!

Page 78. *Stereocaulon alpinum*. Braemar. *Adm. Jones*.

Page 79. *Stereocaulon condensatum*. Cwm Bochlwyd! Crib Goch! Snowdon.

Var *cercolinum*. All the English and Scotch localities very doubtful, the plant being probably *Pilophoron fibula*.

Page 79. Ben Lawers (3800 feet); for Aumbree read Amulree.

Page 80. *Stereocaulon nanum*. Llanymynech! Long Mynd! Shropshire.

Page 81. In all the species of *Rocella* the chemical reaction should be C not K.

Page 81. Mr. Crombie (in litt) says "*Rocella tinctoria* not sufficiently typical in Britain."

Page 83. *Thamnolia vermicularis*, Grampians. *Rev. J. M. Crombie*.

Page 87. *Alectoria bicolor*, Cwm Tryfaen! Aran Mowddu! Twll Du!

Page 88. *Alectoria sarmentosa*, *Mr. Crombie* (in litt) says "I think I saw a specimen of this in Dickson's Herbarium from Scotland."

Page 89. *Alectoria jubata*, for Knack Hill, Crieff, read Knock Hill; Longmynd!

Page 90. *Evernia furfuracea*, for "Crainlorich" read "Crainlarich."

Page 91. *Evernia prunastri*, var *stictocera*, add for fig. Westring Faergh. t. 11. C. Mr. Parfitt (in litt) says, "The habits of this plant in this locality (Exmouth) so far as I know, have not been described. The plant grows attached to the stems and branches of *Erica tetralix*, and nearly all the branches of the *Evernia*, but more particularly in the largest plants become decumbent and attach themselves to the branches of the *Erica*, also and in every instance where this is the case the apices secrete those dark disks. An examination of these dark dots under a high magnifying power, shows them to be composed of a number of minute hyaline filaments surmounted with a dark brown grumous mass of cells which are more or less tenacious or glutinous when moist and adhere firmly to anything to which they may attach themselves."

On the thallus of *E. prunastri*, I found at Nescliffe Hill and the Wrekin, Shropshire, sparingly, the dark fuscous prominent cephalodia mentioned in Nyl. Syn. 285.

Page 91. Dr. Nylander's Monograph of the genus *Ramalina* brings into use new and overlooked characters, and enables us to arrange the species more accurately thus:—

1. *R. thrausta* (Ach.). Pale straw-colour, *filiformi-terete* or *subterete*, here and there compressed, somewhat shining, very slenderly divided and *excessively* branched, *capillari-attenuate* and *interwoven at the apices*; cortical layer filamentose; medulla K—; apothecia unknown.

On old firs and sandy soil in subalpine regions, rare. (1860).

SYN:—*Alectoria thrausta*, Ach. L. U. 596, Syn. 294. *R. thrausta*, Nyl. Mon. Ramal. 18; Leight. Lich. Fl. G. B. 94. in part; Not. Lich. 35; Crombie in Journ. Bot. n. s. 1. 71.

EXS:—Fries, L. S. 267.

GEOG. DISTRIB:—Europe.

SCOTLAND:—Coast of Kincardineshire, *Rev. J. M. Crombie*, (1860.)

2. *R. calicaris* (Hffm.). Pale glaucous-grey, albescent, or albido-flavescens, rigescent, erect, dichotomously branched; *laciniae linear, compressed, elongated, attenuated at the apices, longitudinally lacunoso-canaliculate*; cortical layer filamentose; medulla K—; *apothecia terminal, subtended by the deformed and elongated extremities of the laciniae*; *receptacle rugose beneath*; spores 8, colourless, ellipsoid, straight, 1-septate; spermogonia in pale or colourless receptacles.

On trees, common.

SYN:—*Lobaria calicaris*, Hffm. Fl. Germ. 139. *R. fastigiata*, var. *calicaris*, Ach. L. U. 604, Syn. 297. *R. calicaris*, var. *canaliculata*, Fr. L. E. 30. *R. calicaris*, Nyl. Mon. Ramal. 33; Leight. Lich. Fl. G. B. 92. Not. Lich. 35. Crombie in Journ. Bot. n. s. 1. 71.

FIG:—Dill. t. 23, f. 62, A, B; Moris. 3, § 15, t. 7. f. 5; Ach. Act. Holm. 1797, t. 9, f. 1, r.

EXS:—M. & N. 452; Mudd, 44; Welw. Lusit. 42.

GEOG. DISTRIB:—Europe, Asia, Africa, North and South America.

ENGLAND:—New Forest, *Rev. J. M. Crombie*. Airyholme woods! Ayton, Yorkshire, *Mr. Mudd*. Oswestry!, Shropshire, *Rev. T. Salwey*. Culverhouse and Exmouth Warren! Devon, *Mr. Parfitt*. Shropshire generally!

SCOTLAND:—Ayrshire!, *Mrs. Dobie*. Johnstone Hill, Forfar! *Dr. Gilchrist*.

WALES.—Llandrindod!, Radnorshire, *Rev. T. Salwey*.

Var. *subampliata*, Nyl. *Laciniae* of thallus broader and more dilated, similarly to *R. fraxinea*, longitudinally nervoso-rugose, lacunose and canaliculate; *apothecia marginal and terminal*; *receptacle rugose*; spores straight.

On trees.

SYN:—Nyl. Mon. Ramal. 34 (1870). Leight. Not. Lich. 35.

FIG:—Ach. Act. Holm. 1797, t. 9, f. 1, g, κ.

EXS:—Anzi Lich. Ital. Sup. 63; Anzi Langob. 419.

GEOG. DISTRIB:—France, Portugal, Algeria, East Indies.

ENGLAND:—Yorkshire! *Mr. G. Dixon*. Exminster! Devon. *Mr. Parfitt*. Near Lyndhurst, New Forest, *Rev. J. M. Crombie*. Llanbyddwell rocks!

Var. *subfastigiata*, Nyl. Similar in general appearance to *R. fastigiata*; *apothecia terminal*; *receptacle rugose*; spores straight.

On rocks and trees.

SYN:—Nyl. Mon. Ramal. 34 (1870). Leight. Not. Lich. 35.

FIG:—Ach. Act. Holm. 1797, t. 9, f. 1, η.



EXS :—Welw. Lusit. 44 ; Maudon Mad. 24.

GEOG. DISTRIB :—France, Portugal, Madeira, North America.

IRELAND :—Rocks near Coachford, 11 miles west of Cork !, *Mr. Carroll*. near Fermoy !, *Mr. Chandler*.

WALES :—Llandrindod !, *Rev. T. Salwey*.

*Mr. Crombie*, i.e. mentions a somewhat unusual state, with laciniae much attenuated (f. *attenuata*, *Cromb.*) in New Forest ; and also a singularly caespitose condition with very short and crowded laciniae from Swanston wood, near Edinburgh. *Mr. Sadler*.

3. *R. farinacea* (L.). Whitish, pale straw-coloured or glaucescent, erect, subrigescent, dichotomously branched ; laciniae linear, elongated, undulato-attenuated at the apices, compressed, plane and polished, sometimes sublacunose, canaliculate with white, oblong, more or less confluent soredia on the edges ; cortical layer filamentose ; medulla K— ; “apothecia testaceopallida vel glaucescentia, receptaculo infra laevi ; sporæ ellipsoideo-oblongæ vel fusiformi-ellipsoideæ, rectæ” (Nyl. Mon. 35) ; spermogonia in pale or colourless receptacles.

On trees and palings frequent. I have never seen any specimens in fructification.

SYN :—*Lichen farinaceus*, Linn. Fl. Suec. ed. 2, 1089. *R. farinacea*, Ach. L. U. 606, Syn, 297 ; Nyl. Mon. Ramal. 34 ; Leight. Lich. Fl. G. B. 93 ; Not. Lich. 35. *Crombie* in Journ. Bot. n. s. l. 71.

FIG :—E. Bot. t. 889 ; Ach. Act. Holm. 1797, t. 11. f. 1.

EXS :—M. & N. 356 ; Anzi Etr. 6 ; Anzi Ital. Sup. 67 ; Schær. 494 ; Mudd 45.

GEOG. DISTRIB :—Europe, Asia, Africa, North and South America, Polynesia, Australia.

ENGLAND :—Norfolk, *Rev. H. Bryant*. Clapham Park Wood, Bedfordshire, *Rev. C. Abbot*, New Forest, *Mr. Lyell*. near Newton ! and Kildale ! Cleveland, Yorkshire !, *Mr. Mudd*. Oswestry !, Shropshire, *Rev. T. Salwey*. Thirsk !, Yorkshire, *Mr. Baker*. Stoke Wood ! Exeter, *Mr. Parfitt*. Stomere woods !, Haughmond Hill ! Shropshire ; Dinmore Wood !, Herefordshire.

SCOTLAND :—Balthayock woods !, Perth, *Dr. Lindsay*. Ayrshire !, *Mrs. Dobie*.

IRELAND :—Fermoy !, *Mr. Chandler*. Dunkerron, *Dr. Taylor*.

WALES :—Carmarthenshire, *Mr. Forster*. Glynn, near Capel Curig !

Very variable ; many forms, minute in size, frequently occur, but scarcely worth distinguishing.

When the soredia in *R. farinacea* are touched with K they exhibit no reaction or only sometimes a very faint yellow, which, on the immediate application of C becomes of a full yellow.

4. *R. fraxinea* (L.). Pale straw or yellowish, or glaucescent, pendulous, straggling, subrigescent ; laciniae compressed, more or less broadly applanato-dilated, lacunose, longitudinally rugose or nervose, elongated and attenuated at the apices ; cortical layer filamentose ; medulla K— ; apothecia large, marginal and superficial,

brownish-yellow or glaucescent; *receptacle rugose or plicato rugose*; spores 8, colourless, oblong, *curved*, 1-septate; spermogonia in pale colourless receptacles.

On trees, very common.

SYN:—*Lichen fraxineus*, Linn. Fl. Succ. ed. 2, 1091. *R. fraxinea*, Ach. L. U. 602, Syn. 296; Nyl. Mon. Ramal. 36; Leight. Lich. Fl. G. B. 94; Not. Lich. 35; Crombie in Journ. Bot. n. s. 1. 72.

Forma typica *teniaeformis*, Ach. *Laciniae moderately dilated*, very much *elongated, attenuate at the base and apex, longitudinally rugose or nervoso-plicate*.

SYN:—*R. fraxinea*, var. *teniaeformis*, Ach. L. U. 603; Nyl. Mon. Ramal. 37.

FIG.—E. Bot. t. 1781; Westr. Faergh. t. 12, c.

EXS:—Anzi Ital. Sup. 60, and 59, A, B, D; Mass. Ital. Anzi, 116; M. & N. 158 (two lower specimens); Schær. 492, (left-hand specimen).

GEOG. DISTRIB:—Europe, Asia, Africa, North and South America, Polynesia, Australia.

ENGLAND:—Cambridgeshire, *Rev. R. Relhan*.

WALES.—Llandrindod!, *Rev. T. Salwey*; Edderton Wood!, Montgomeryshire.

Forma *ampliata*, Ach. *Laciniae excessively and very broadly applanato-dilated*, lacunose, *longitudinally coarsely rugose or nervose, and transversely subreticulato-rugose, apices obtuse and deformed*.

SYN:—*R. fraxinea*, var. *ampliata*, Ach. L. U. 603; Nyl. Mon. Ramal. 37.

FIG:—Hoffm. Pl. Lich. t. 18; Dill. t. 22. fig. 59, c.

EXS:—Anzi Ital. Sup. 62, 59, c; Schær. 492 (right-hand specimen); M. & N. (upper specimen); Leight. 38; Mass. 119, 118, A; Mudd. 42; Bohl. 21.

GEOG. DISTRIB:—Europe.

ENGLAND:—Charnwood Forest!, Leicestershire, *Rev. A. Bloom*. Thirsk!, Yorkshire, *Mr. Baker*. Oswestry!, Shropshire, *Rev. T. Salwey*. near Ayton!, Cleveland, *Mr. Mudd*. Exminster! Devon, *Mr. Purfitt*. near Shrewsbury!, Pulley!, Llanyblodwell rocks!, Shropshire; Dinmore Wood!, Herefordshire.

SCOTLAND:—Invercanld!, Braemar. *Dr. Lindsay*.

5. *R. fastigiata* (Pers.). Pale yellowish straw-colour, small, *densely caespitose*, *laciniae subcompressed, dilated and inflated upwards*, smooth and somewhat lacunose and nervoso-rugose; cortical layer filamentose; medulla K—; apothecia terminal, peltato-sessile, *subfastigate, subtended by the very short, deformed, divaricate extremities of the laciniae*; *receptacle plicato-rugose*; spores 8, colourless, ellipsoideo-oblong, *straight, curved and gibbous*, 1-septate; spermogonia in pale colourless receptacles.

On trees, common.

SYN:—*Lichen fastigiatus*, Pers. in Uster. N. Ann. Bot. i p. 256. *R. fastigiata*, Ach. L. U. 603, Syn. 296; Nyl. Mon. Ramal. 39; Leight. Lich. Fl. G. B. 94; Not. Lich. 35; Crombie. l. c.

FIG:—E. Bot. t. 890 (lower left-hand fig.) ; Dill. t. 23. f. 62, c ; Ach. in Act. Holm. 1797, t. 9. f. 1, B, E ; Westr. Faergh, t. 12. f. E.

EXS:—Bohl. 22 ; Leight. 39 ; Larbal. 60 ; Mudd 43 ; Welw. Lusit. 41 ; M. & N. 452 ; Anzi Etr. 5 ; Anzi Ital. Sup. 64.

GEOG. DISTRIB:—Europe, Asia, Africa, North America.

ENGLAND:—Bedfordshire, *Rev. C. Abbot*. Charnwood Forest !, Leicestershire, *Rev. A. Blom*. Oswestry !, Shropshire, *Rev. T. Salway*. Ayton !, Cleveland, *Mr. Mudd*. Pulley !, Haughmond Hill !, Lyth Hill !, near Shrewsbury ! ; Llanyblodwell Rocks !, Shropshire ; Dinmore !, Herefordshire.

SCOTLAND:—Kinnoul Hill !, Perth ; Yester House !, Haddington, *Dr. Lindsay*.

IRELAND:—Great Island !, Cork, *Mr. Carroll*.

WALES:—Edderton Wood !, Montgomeryshire.

CHANNEL ISLANDS:—Jersey !, Sark !, &c. *Mr. Lorbalestier*.

Of this lichen Dr. Nylander remarks (*L. c.*):—"Vix est nisi varietas *R. fraxinea*, thallo magis contracto et subfastigiato-diviso vel laciniis subfastigiatis. Spore magis typice curvulae quam in *R. calicari*, quae certe artissime affinis, et forsitan haec ambae aliaeque cohabitantes saepe hybridas proferant formas intercedentes, quarum determinatio aliquando nonnihil incerta maneat ; typus tamen saepius notis datis sat facile est agnoscendus."

6. *R. polymorpha*, Ach. Pale straw-colour or glaucous, rigid, small, robust, densely caespitose, sublinear-lacinate ; *lacinae dilatato-compressae, coarsely longitudinally striato-rugose and sublucunose, subopaque, globuloso-granuloso sorediate* ; cortical layer filamentose ; medulla K— ; apothecia marginal or sub-terminal ; *receptacle rugoso-unequal or nearly smooth ; spores 8*, colourless, oblongo-ellipsoid or oblong, *nearly straight or straight*, 1-septate ; spermogonia in pale colourless receptacles.

On maritime rocks, frequent.

SYN:—*R. polymorpha*, Ach. L. U. 600, Syn. 295 ; Nyl. Mon. Ramal. 50 ; Crombie, l. c. 72.

FIG:—Ach. Act. Holm. 1797, t. 11. f. 3.

EXS:—Fries, L. S. 144.

GEOG. DISTRIB:—Europe, Africa.

Forma *ligulata*, Ach. *Lacinae thick, rigid, cartilaginous, either plane and nearly simple or broader and deformed, and covered with sorediate pustules.*

On maritime rocks.

SYN:—*R. polymorpha*, var. *ligulata*, Ach. Syn. 295 ; Nyl. Mon. Ramal. 51 ; Leight. Lich. Fl. G. B. 92.

FIG:—Ach. Act. Holm. 1797, t. 11. f. 3, A, B, E, F, K.

EXS:—Mudd, 47 ; Leight. 73.

ENGLAND:—Roseberry Topping !, Howden Gill !, Cleveland, *Mr. Mudd*. Whitsuncliffe !, near Thirsk, Yorkshire, *Mr. Baker*. Shanklin Church !, Isle of Wight, *Rev. T. Salway*. Bovisand, Plymouth ! *Mr. Holmes*. Caer Caradoc !, Shropshire.

SCOTLAND :—Coast of Kincardineshire, *Rev. J. M. Crombie*.

I have never seen any fructification.

Forma *emplecta*, Ach. *laciniae* attenuate, excessively branched, acuminate and *granulate at the apices*.

On rocks.

SYN :—Ach. Syn. 295 ; Nyl. Mon. Ramal. 51.

FIG :—Ach. Act. Holm. 1797, t. 11. f. 3. c. p. z.

SCOTLAND :—Morrone and Craig Tulloch !, *Rev. J. Crombie*.

CHANNEL ISLANDS : The Warren ! Noirmont, Jersey. *Mr. Lerbalestier*.

Forma *depressa*, Cromb. *Cespitose*, *laciniae* short, stunted, *ulate*.

• On maritime rocks.

SYN :—Crombie in Journ. Bot. n. s. 1. 72.

ENGLAND :—Polperro and Tintagel, Cornwall ; between Brighton and Portsdown, *Mr. Forster*.

SCOTLAND :—Coast of Kincardineshire, *Rev. J. M. Crombie*.

CHANNEL ISLANDS :—Guernsey, *Rev. T. Salwey*.

7. *R. pollinaria*, Ach. Pale straw-colour or whitish, or albidoglaucous, *densely caespitose*, *membranaceo-laciniose* ; *laciniae* short, dilated and compressed, somewhat shining, sublacinose or lacunoso-corrugate, *flaccid*, covered with broad, white, *farinoso-sorediate*, confluent patches ; cortical layer filamentose ; medulla K— ; apothecia marginal and terminal ; *receptacle unequal* ; spores 8, colourless, oblong, *straight or gibbous*, 1-septate ; spermatogonia in pale colourless receptacles.

On trees, palings, rocks, &c.

SYN :—*R. pollinaria*, Ach. Syn. 293 ; Nyl. Mon. Ramal. 52 ; Leight. Lich. Fl. G. B. 95 ; Not. Lich. 35 ; Crombie, l. c. 73.

GEOG. DISTRIB :—Europe, Africa.

Forma *clavata*, Ach. *Laciniae* suberect, elongate, plane, sublinear, attenuate and albo-pulverulento-sorediate at the apices.

FIG :—Ach. Act. Holm. 1797, t. 11. f. 2. A, B, C, F.

EXS :—Schær. 393 ; Hepp 564, 565 ; M. & N. 546.

ENGLAND :—Near Hastings, *Rev. J. M. Crombie*. Plymouth ! *Mr. Holmes*. Haughmond Hill !, Shropshire.

Forma *humilis*, Ach. *Membranaceo-dilated*, *laciniose*, with broad, confluent, powdery white soredia.

FIG :—Ach. Act. Holm. 1797. t. 11. f. 2. D.

EXS :—Muhl 46, in part.

ENGLAND :—Ingleby !, Cleveland. *Mr. Mudd*. Walthamstow, Essex. *Mr. Forster*. Tunbridge Wells. *Rev J. M. Crombie*.

If the soredia of *R. pollinaria* be wetted with K it immediately sinks just like water would do, but producing no reaction either on them or on the thallus.

8. *R. coccinoides*, Nyl. pale straw-colour or whitish, *membranaceous*, dilated and compressed, *flaccid*, subopaque, frequently *reticulato-impure* or *reticulato-scribulate*, or slightly rugulose, or here and there plane, variously lacinate, *laciniae* diffracted with broad white *farinoso-sorediate* confluent patches or denudations of the cortical layer ; cortical layer thin, amorphous ; medulla K— ;



"apothecia pallido-testacea vel pallido-glaucescencia ; receptaculum subtus rugosum" ; spermogonia in pale colourless receptacles.

On trees, palings, &c.

SYN :—Nyl. Prodr. Gall. Alger. 47 ; Nyl. Mon. Ramal. 55 ; Crombie, l. c. 73.

FIG :—Ach. Act. Holm. 1797, t. 11. f. 2, E. E. Bot. 1607 ; Dill. Musc. t. 21, f. 57, c. D.

Exs :—Mudd. 46 in part. Leight. 41.

GEOG. DISTRIB :—Europe, Asia, Africa.

ENGLAND :—Testwood Park, New Forest. *Mr. Lyell*. Near Lyndhurst, New Forest! *Rev. J. M. Crombie*. (1866) ; Gopsall ! Leicestershire. *Rev. A. Blaxam*. Ingleby ! Cleveland. *Mr Mudd*. Stoke Wood ! Exeter. *Mr Parfitt*. Isle of Wight. *Rev. T. Salwey*. Haughmond Hill ! Shropshire.

IRELAND :—Near Belfast. *Dr. Taylor*.

Probably common in Great Britain but confounded with *R. pollinaria*. If the soredia of *R. evernioides* be touched with K they are unaffected, but if immediately afterwards they are wetted with C, it sinks immediately just as water would do, but producing no reaction of colour either on them or on the thallus, thus distinguishing it from all states of *R. pollinaria*.

9. *R. scopulorum*, (Dicks.). Pale straw-colour, rigid, cartilaginous, *shining* ; *laciniae elongate, linear, subtereti-compressed*, simple, or branched at the apex, attenuate ; cortical layer solid, external portion amorphous, internal portion filamentose ; *medulla K yellow, then ferruginous-red* ; apothecia marginal and subterminal ; *receptacle nearly smooth* ; spores 8, colourless, oblong, straight, 1-septate ; spermogonia in pale colourless receptacles, sometimes nigricant.

On maritime rocks, rare.

SYN :—*Lichen scopulorum*, Dicks. Crypt. Brit. 3. 18. *R. scopulorum*, Ach. L. U. 604, Syn. 297 ; Nyl. Mon. Ramal. 58, Leight. Lich. Fl. G. B. 91 (in part) ; Not. Lich. 35 ; Crombie, l. c. 74.

FIG—E. Bot. 688 ; Nyl. Syn. t. 8. f. 29.

Exs :—Larbal. 13 ; Bohl. 112.

GEOG. DISTRIB :—Europe, Africa.

ENGLAND :—Lamorna Cove, Cornwall. *Mr. Knapp*. Lands' End. *Messrs. Turner and Sowerby*. South Coast of England. *Mr. Foster*. Leigh Tor. Devon. *Dr. Holl*.

SCOTLAND :—*Mr. Dickson* (l.c.). Isle of Arran, *Mr. Lyle*. Kincardineshire and Orkney, *Rev. J. M. Crombie*.

IRELAND :—Ardglass, Down, *Mr. Lyle*.

WALES :—Aberystwith. *Mr. Foster*.

CHANNEL ISLANDS :—Grosnez Common, Jersey ! *Mr. Larbalestier*.

Var. *subfarinacea*, Nyl. M.S. very similar in general external appearance to *R. farinacea*, but the soredia and medulla K yellow then ferruginous-red.

On subalpine rocks, not common.

SYN :—Crombie, l. c. 74.



ENGLAND :—Langbraugh, Cleveland, Yorkshire ! *Mr. Mudd*. Blackington Rocks ! Devon, *Mr. Parfitt*. Malvern Hills, *Dr. Holl*. Plymouth ! *Mr. Holmes*. Longmynd ! Shropshire.

SCOTLAND :—Portlethen, Kincardineshire. *Rev. J. M. Crombie*. Kinnoul Hill, Perth. *Dr. Lindsay*.

10. *R. cuspidata* (Ach.). Pale straw-colour, rigid, cartilaginous, shining ; *lacinie* elongate, linear, compressed, more or less longitudinally striato-nervose, lacunose and sorediato-tuberculate, simple or dichotomously branched ; cortical layer solid, external portion amorphous, internal portion filamentose ; *medulla* K— ; apothecia marginal and subterminal ; *receptacle* smooth ; *spores* 8, colourless, oblong, straight, 1-septate ; *spermogonia* in pale colourless receptacles.

On maritime rocks, frequent.

*Dr. Nylander* (l. c.) remarks :—“ Forsan non vere specie differat a *R. scopulorum*, tamen præsertim ob reactionem kalicam deficientem, seorsim hic est exponenda.”

SYN :—*R. scopulorum*, var. *cuspidata*, Ach. L. U. 605, Syn. 297. *R. scopulorum*, Leight. Lich. Fl. G. B. 91 (in part) ; Not. Lich. 35 ; *R. cuspidata*, Nyl. Mon. Ramal. 60. *Crombie*, l. c. 74.

FIG :—Ach. Act. Holm. 1797. t. 9. f. 2, B ; Dill. t. 17. f. 39, A.

EXS :—Th. M. Fries, 1 ; Anzi Ital. Sup. 69 ; Schær. 554 ; Hepp, 837 ; Leight. 2 ; Rabh. 864.

GEOG. DISTRIB :—Europe, Asia, Africa, North America.

ENGLAND :—Yorkshire !, *Mr. Dixon*. Blackingstone rocks !, Lustleigh Cove ! Babicombe ! Devon, *Mr. Parfitt*. Membrie, Devon, *Dr. Holl*. Bovisand, Plymouth ! *Mr. Holmes*.

SCOTLAND :—Kincardineshire ! *Rev. J. M. Crombie*.

WALES :—Near Aberystwith, *Mr. Foster*. Bardsey Island, Carnarvonshire ! *Mr. Johnston*. South Stacks ! Holyhead.

Page 97. *F. 2 crispa*, Moel Goch, Cwm Cywion !

*Mr. Plowright* has sent me specimens gathered by himself at North Wootton Common, Norfolk, where he states the lichen is abundant, and that North Wootton Church which is exactly intermediate between the Common and the Sea is only 33 feet above the level of the sea.

Page 97. *C. Delisei*. FIG. Westr. Faergh. t. 16. c.

Page 97. *Cetraria aculeata* f. *muricata*, Cwm Cywion !

Page 99. *Platysma triste*, fruit, Cwm Tryfaen ! Glyder Fach ! Cwm Fynnon lloer !

Page 100. *Platysma scarpincola*. *Mr. Crombie* (in litt.) says “ most of the localities no doubt referable to *ulophylla*. Not a single specimen of the type in Herb. Brit. Mus.”

Page 102. *Platysma glaucum*, Capel Curig ! Wrekin ! Aran Mowddu !

Page 102. *Platysma pinastri*, Ravine of St. John, Cornwall. *Rev. T. Subvey*.

Page 105. *Nephromium parile*, Drwsynant !

Page 106. *Nephromium lusitanicum*, Glyn ! near Capel Curig (fruit).

Page 107. *Peltigera upthosa*, Eglswg rocks !

Page 108. *Peltigera rufescens*, Barmouth ! *Rev. T. Salway*.  
Craigforda ! Llanymynech Hill ! Grinshill !

Page 112. *Solorina saccata*, Glyn ! near Capel Curig.

Page 113. *Solorina limbata*, Mr. Crombie (in litt) says "I doubt if after all this is the plant of E. Bot. 1374. The figure is very unlike as to the thallus. No specimen in Herb. Sowerby, in Brit. Mus."

Page 115. *Stictina limbata*, Glyn ! near Capel Curig ; Drwsynant !

Page 116. *Stictina fuliginosa*, Glyn ! near Capel Curig ; Drwsynant !

Page 118. *Sticta pulmonacea*, Glyn ! near Capel Curig.

Page 122. *Parmelia caperata*, Glyn ! near Capel Curig.

Page 122. *Parmelia olivacea*, add to diagnosis :—thallus smooth or minutely corrugate or sometimes varnished.

Exs :—dele Bohl. 86. Schær. 370. 371. Anzi. Ven. 20. Mass. 167

SCOTLAND :—dele Fort Augustus, Caledonian Canal. *Dr. Lindsay*

Var. *exasperata*, add, thallus subopake.

Exs :—Add Schær. 370 right hand specimen.

ENGLAND :—Wilcot ! Shropshire. SCOTLAND :—Fort Augustus, Caledonian Canal ! *Dr. Lindsay*.

Var. *prolixa*—Exs. add Hepp. 715.

Var. *dendritica*, (Pers.) castaneo-fuscous, or badio-nigricant, stellato-orbicular, appressed, laciniæ narrow, imbricated, variously divided, multifid, subteretely convex, flexuose, incurved, under surface nigricant.

On rocks.

SYN :—Persoon in Acta Soc. Wetterav. 2. p. 16.

Exs :—Anzi Venet. 20. Leight. 365.

ENGLAND :—Caer Caradoc ! Shropshire.

WALES :—Moel-y-Golfa ! Montgomeryshire.

Page 124. *Parmelia lanata*, Cader Idris ! *Rev. T. Salway*.

Page 128. *Parmelia cetrarioides*, Capel Curig ! Drwsynant !

Page 128. *Parmelia perlata* & var. *ciliata*, Glyn, near Capel Curig !

Page 128. 7\* *P. hyperopta* (Ach.) albido-cinereous, membranaceous, closely adherent, laciniato-lobate, central lobes somewhat convex, rugoso-plicate ; soredia roundish, elevated, albo-pulverulent ; lobes of the circumference linear, plane, naked ; medulla K— ; apothecia scattered, brown and shining, margin crenulate, spores S, colourless, linear-oblong, simple, curved, lunulate or falcate, minute.

On pine trees, rare. 1870.

SYN :—Ach. Syn. 208. Korb. Syst. L. Germ. 73.

FIG :—Nyl. Scand. t. 1. f. 1.

Exs :—Anzi Langob. 51. Fellm. 85.

SCOTLAND :—Glen Dee, Braemar. *Rev. J. M. Crombie*.

Well distinguished from *P. alcurites*, with which it has been heretofore confounded, by the round separated soredia, and the curved spores, and different reaction, the entire central portion of the thallus in *P. alcurites* being sorediate.

Page 130. *Parmelia aëurites*, add spores straight, dele Felm. 95 and Glen Dee, Braemar. *Rev. J. M. Crombie*.

Haughmond Hill! Shropshire, very abundant and fine.

Page 131. *Parmelia tiliacea* var. *sublaevigata*, Drwsynant!

Page 133. *Parmelia Borreri*, (Turn.) typical form:—Leight. 231, Mass. 107. Zw. 251. M. & N 634. Schaer. 361. Hepp. 582. Larchal. 20. Anzi Langob. 374. Wagner 13.

Glyn! Capel Curig!

Forma *olivacea*, *Leight*. olivaceo-virescent, like *P. olivacea*, (L.) but with different reaction (medulla white C red,) M & N. 161 upper specimen. Mass. 167. Hepp. 866. Bohl. 86.

On trees, very frequent, but sterile, throughout Shropshire!, Montgomeryshire!, Denbighshire! and Carnarvonshire!

Page 134. *Parmelia conspersa*, particularly fine and in fruit in Nant Francon!

Page 134. *Parmelia fuliginosa*, Castleton, Braemar! *Mr. Crombie*. Forfarshire! *Mr. Drummond*. Norfolk! *Mr. D. Turner*.

Page 137. *Parmelia saxatilis*, Bwlch mountain, near Aberystwith. *Miss Atwood*. (in fruit) Cwm Cywion! Aran Mowdddy!

Page 138. *Parmelia omphalodes*, in fine fruit, Cwm Idwall!

Page 140. *Physcia chrysophthalma*, *Mr. Crombie* (in litt.) says "surely not so far inland in England as Settle. Dr. Windsor made some mistake and if I remember rightly expressed some doubts in the *Phytologist*; even *flavicans* can scarcely occur at Settle."

Page 142. *Physcia parietina*, Aberayron, Cardiganshire. *Miss Atwood*.

Page 144. *Physcia parietina* var. *polycarpa*, Stiperstones!

Page 145. line 19, for "Kirricumie" read "Kirimuir."

Page 146. *Physcia pulverulenta*, very fine on trees in Bettws-y-coed Church Yard.

Var. *muscigena*. *Mr. Crombie* (in litt.) says "Mudd confounded *pitgea* with this. Dr. Holl's plant from Malvern not this at all and I doubt his Ben Lawers one also. I have myself examined that mountain too well for many years to overlook any plant so well known. I have it however very sparingly from Craig Tulloch."

Page 148. *Physcia obscura*, Edderton!

Page 148. *Physcia obscura* var. *chloantha*, Llanforda!

Var. *viridula*, Wortfield! and Llanymynech! and on rocks on Haughmond Hill! and Llanymynech Hill!

Page 149. *Physcia adglutinata* (Flk), *Mr. Crombie* (in litt.) says "a very good species."

Page 150. *Physcia stellaris*, Aberystwith, *Miss Atwood*.

Page 151. *Physcia stellaris* var. *leptalea*, Scotland:—S. W. Grampians, common. *Rev. J. M. Crombie*. Edderton!

Page 153. *Parmelia aquila*, Kincardineshire, *Rev. J. M. Crombie*. Moel-y-Golfa!

Page 154. *Umbilicaria pustulata*, Drwsycoed, near Nantle, Cardiganshire. *Miss Atwood*. Grinshill!

Page 155. *Umbilicaria polyphylla*, Cwm Tryfaen! Cwm Bochlwyd! Pass of Llanberis! Aran Mowdddy! Caer Caradoc! Long Mynydd!

forma *congregata*. Cwm Tryfaen !

Page 156. line 1 and 37, for "Raynock" read "Koynoch."

Page 158. *Umbilicaria crosa*, Cwm Tryfaen ! Cwm Bochlwyd ! Cwm Ffynnon Iloer ! and Cwm Ffynnon Llugwy !

Page 159. *Umbilicaria polyrhiza*, Cwm Ffynnon Iloer ! Cwm Ffynnon Llugwy !

Page 160. *Umbilicaria proboscidea*, Cwm Tryfaen !

Page 161. line 8 for "under" read "upper."

Page 161. *Umbilicaria cylindrica*, Cwm Tryfaen ! Cwm Bochlwyd ! Aran Mowddu ! Cwm Ffynnon Iloer ! Cwm Ffynnon Llugwy !

Page 164. for *caeruleo-badia* ("Schar") read "Schleich." and add Glyn, near Capel Curig ! Drwsynant !

Page 165. *Pannaria elaeina*, Mr. Crombie (in litt.) says "not the plant, I believe, of Eng. Bot. nor British."

Page 165. *Pannaria pezizoides*, Cwm Cywion ! abundant in the Grampians, *Rev. J. M. Crombie*.

Page 167. *Pannaria curvescens*, Mudd. not *Pannaria* but *Lecanora*, see Nyl. Lapp. or. 135 and Leight. Lich. Fl. G. B. 214. Above Loch-na-cat, *Rev. J. M. Crombie*.

Page 168. *Pannaria nigra*, Llanyblodwell rocks !

Page 170. *Pannaria plumbea*, Bettws-y-coed Church Yard !

Page 171. *Squamaria crassa*, Great Orme's Head ! Eglswg rocks !

Page 174. *Squamaria gelida*, Cwm Cywion ! Aran Mowddu !

Page 175. *Placodium murorum*, frequent in lowlands and maritime districts of Scotland. *Rev. J. M. Crombie*. Forfar, *Mr. Croll*. near Yarmouth ! *Mr. D. Turner*.

Var. *obliteratum*, most abundant on walls about Rhyl !

Var. *miniaturum*, Llanymynech Hill !

Page 176. *Placodium decipiens*, Framlingham Castle ! Hernefleet ! *Mr. D. Turner*. Rhyddlan Castle !

Page 176. *Placodium callopismum*, Old Aberdeen and Dumbane. *Rev. J. M. Crombie*. Eglswg rocks !

Page 177. Var. *plicatum*. Scotland, Blair Athole. *Rev. J. M. Crombie*. Eglswg rocks !

Page 177. *Placodium citrinum*, frequent in lowland districts of Scotland, *Rev. J. M. Crombie*. Eglswg rocks ! Broomhill, near Oswestry !

Page 178. *Placodium elegans*, the true plant in Mr. D. Turner's Herbarium at Kew ! often confounded with *miniaturum*.

Page 179. *Placodium chalybeum*, Glyn, near Capel Curig ! Eglswg rocks !

Page 178. *Placodium candicans*, Llanyblodwell rocks ! Eglswg rocks !

Page 185. forma *privigna*, Mr. Crombie (in litt.) refers the specimens from Boxley Hill, Sussex ; New Forest, Hants ; Lyndhurst Moor, and Epping Forest to var. *Heppii* (Naeg.) = Hepp. 57.

Page 187. line 9. for granite "rocks," read "walls."

Page 187. *Lecanora sarcopis*, near Exeter. *Rev. J. M. Crombie*.

Page 187. *Lecanora tartarea*, Capel Curig ! Cwm Cywion !

Page 188. forma *grandinosa*, Glyn! near Capel Curig; Cwm Tryfaen!

Page 188. forma *frigida*, Cwm Cywion!

Page 188. *Lecanora parella*, Drwsynant! Craigforda!

Page 189. *Lecanora parella* forma *pallescens*, Glyn! near Capel Curig; Llanyblodwell rocks!

Page 192. *Lecanora variat*, (Ehrlh.) common in Scotland, *Rev. J. M. Crombie*.

Page 193. Var. *saxipicola*, Exeter, Devon. *Rev. J. M. Crombie* Stiperstones! Sutton! near Shrewsbury; Haughmond Hill!

Page 193. Var. *conizaea*, for "Scotland" read "Ireland;" and add SCOTLAND:—Killin, Durris, *Rev. J. M. Crombie*. Worthing! *Rev. T. Sulway*. Wrekin!

Page 194. *Lecanora atra*, Llyn Cwlyd! Glyn! near Capel Curig; Eglswg rocks! Craigforda! Moel-y-Golfa!

Page 194. *Lecanora leucophaca*, Crib Goch! Snowdon. Pass of Llanberis! Aran Mowddu!

Page 196. *Lecanora argopholis*, Glyn! near Capel Curig; Cwm Cywion!

Page 197. *Lecanora polytropa*, Breadalbane, Braemar, *Rev. J. M. Crombie*.

Page 197. forma *conglobata*, (Smrf.) Grampians, Scotland. *Rev. J. M. Crombie*.

Page 198. *Lecanora intricata*, (Schrad.) Breadalbane and Port-lothen, Kincardineshire, Scotland, *Rev. J. M. Crombie*. Cwm Bochlwyd! Cwm Cywion! Llyn Cwlyd!

Page 199. *Lecanora orosthea*, (Ach.) Braemar, Kincardineshire, Scotland. *Rev. J. M. Crombie*. Glyn! near Capel Curig; Llyn Cwlyd!

Page 200. *Lecanora oculata*, crase Cawley rock, Exeter. *Mr. Purpitt*.

Page 200. *Lecanora sulfusca*, f. *allophana*, Glyn! near Capel Curig.

Page 201. f. *argentata*, Capel Curig!

Page 202. f. *coelocarpa*, Cwm Cywion! Castle Dinas Bran!

Page 202. f. *gangalea*, Craigforda!

Page 203. forma *atrypica*, Ach. Cove, Kincardineshire, Scotland. *Rev. J. M. Crombie*.

Page 203. forma *chlarana*, Ach. not uncommon in Scotland. *Rev. J. M. Crombie*.

Page 204. forma *albella*, (Pers.) not uncommon in Scotland. *Rev. J. M. Crombie*.

Page 207. *Lecanora umbrina*, Eglswg rocks!

Page 207. *Lecanora umbrina*, f. *crenulata*, (Dicks.) pretty frequent in Scotland. *Rev. J. M. Crombie*.

Page 209. *Lecanora calcarca*, Killin; Appin; Blair Athole. *Rev. J. M. Crombie*. Llanyblodwell! Eglswg rocks!

Page 207. f. *Hoffmanni*, Llanyblodwell rocks!

Page 210. f. *lucastriis*, Grampians, common. *Rev. J. M. Crombie*.

Page 211. *Lecanora Dicksonii*, Crib Goch, Snowdon!



- Page 211. *Lecanora cinereo-rufescens*, Aberystwith, Miss Atwood.  
 Page 212. *Lecanora badia*, Cwm Bochlwyd ! Cwm Cywion !  
 Llyn Cwlyd ! Stiperstones !  
 Page 213. f. *cinerascens*, Crib Goch ! Snowdon ; Aran Mowdddy !  
 Page 214. *Lecanora rhypariza* f. *curvescens*, Mr. Carroll (in lit.)  
 says, "very near, if not identical with *L. castanea*, Hepp, which I  
 found in Norway."  
 Page 217. *Lecanora aurantiaca* var. *erythrella*, Llanyblodwell  
 rocks !  
 Page 224. *Lecanora sophodes*, f. *archæna*, Ach. on poplar, Llany-  
 mynech Hill !  
 Page 227. *Lecanora holophæa*, Pulborough. Mr. Davies. Myt-  
 ton Bach ! Stiperstones.  
 Page 232. *Lecanora hæmatomma*, Cwm Ffynnon Llugwy. !  
 Page 233. *Lecanora ventosa*, Cwm Tryfaen !  
 Page 234. *Urcularia scruposa*, Aran Mowdddy ! Grinshill !  
 Page 236. *Pertusaria Westringii*, Westring Faergh. t. 4. Crib  
 Goch, Snowdon !  
 Page 238. *Pertusaria dcalbata*, Cwm Bochlwyd ! Crib Goch,  
 Snowdon ! Aran Mowdddy !  
 Page 238. *Pertusaria communis*, Glyn ! near Capel Curig ; Bettws-  
 y-coed !  
 Page 239. *Pertusaria dactylina*, Cwm Cywion !  
 Page 240. *Pertusaria fallax*, Bettws-y-coed ! Llanyblodwell  
 rocks !  
 f. *sulphurea*, flavo-sulphury, Cwm Clyd ! Crib Goch !  
 Page 241. *Pertusaria velata*, Cwm Cywion ! Aran Mowdddy !  
 Page 243. *Pertusaria globulifera*. Llanyblodwell rocks !  
 Page 244. *Pertusaria pustulata*, Tanybwlech ! near Capel Curig  
 Page 244. *Pertusaria leioplaca*, Drwsynant ! Llanyblodwell  
 rocks !  
 Page 246. *Phlyctis agelæa*, Edderton Wood ! Forden, Montgom-  
 eryshire.  
 Page 249. *Lecidea Salweyi*, Saints Bay ! Guernsey, Rev. T. Sal-  
 wey. Crib Goch, Snowdon !  
 Page 252. *Lecidea lurida*, Cellfawr, Barmouth ! Rev. T. Salwey.  
 Eglswg rocks ! Great Ormes Head !  
 Page 254. *Lecidea ostreata*, for Leight. 56. read Leight. 50.  
 Haughmond Hill ! Sharpstones !  
 Page 255. *Lecidea advertens*, Cwm Idwall ! Cwm Bochlwyd !  
 Page 256. *Lecidea dispansa*, Cwm Idwall !  
 Page 256. *Lecidea sylvicola* var. *infidula*, Cwm Cywion !  
 Page 259. *Lecidea purissima*, Boreatton ! Shropshire. Mr. W.  
 Phillips.  
 Page 264. *Lecidea quernæa*, Wrekin ! Llanyblodwell rocks !  
 Page 264. *Lecidea viridescens*, near Shrewsbury !  
 Page 265. *Lecidea sanguinaria*, Craigforda ! Cwm Bochlwyd !  
 Page 265. *Lecidea enteroleuca*, Llanforda ! Eglswg rocks !  
 Page 268. *Lecidea sanguineo-atra*, Drwsynant !  
 Page 275. *Lecidea aploea*, Llyn Cwlyd ! Aran Mowdddy !

- Page 277. *Lecidea mollis*, Caer Caradoc!
- Page 278. *Lecidea corcistata*, f. *involuta*, Cwm Cywion! Lyth Hill! Drwsynant! Pass of Llanberis! Aran Mowdddy! Eglswg rocks!
- Page 280. *Lecidea panicola*, Cwm Cywion! Cwm Tryfaen! Cwm Bochlwyd! Llyn Cwlyd! Glyder Vach! Aran Mowdddy!
- Page 281. *Lecidea tenebrosa*, Devil's Chair, Stiperstones! Caer Caradoc!
- Page 281. *Lecidea Bruyeriana*, Aran Mowdddy!
- Page 283. *Lecidea polycarpa*, Pass of Llanberis! Devil's Chair, Stiperstones!
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